VOL. 27 No. 12

BULLETIN

OF THE

TORREY BOTANICAL CLUB

DECEMBER 1900

New Species of Fungi

BY CHARLES H. PECK

Amanita submaculata

Pileus convex or subcampanulate, glabrous, shining, even on the margin, dark brown, more or less marked by whitish stripes or spots; lamellae thin, subdistant, free, white; stem equal, bulbous, glabrous, solid, white, the annulus large, membranous, white.

Pileus 7–9 cm. broad; stem 7–9 cm. long, 6–12 mm. thick.

Scattered or cespitose. Thin woods and open places. North Carolina. July. Miss M. L. Wilson.

The species is easily recognized by the white spots on the pileus. The specimen examined yielded no spores.

Amanita radicata

Pileus subglobose, becoming convex, dry, verrucose, white, margin even, flesh firm, white, odor resembling that of chloride of lime; lamellae close, free, white; stem solid, deeply radicating, swollen at the base or bulbous, floccose or mealy at the top, white, veil thin, floccose or mealy, white, soon lacerated and attached in fragments to the margin of the pileus or evanescent; spores broadly elliptic, 7.5–10 μ long, 6–7 μ broad.

Pileus 5–10 cm. broad; stem 2.5–7.5 cm. long, 8–12 mm. thick.

Woods. New Jersey. July. E. B. Sterling.

The species is closely related to *A. strobiliformis*, from which it is separated by its uniformly white color, radicating stem, peculiar odor and smaller spores. The warts of the pileus are numerous large and firm. They are either white or brown, or white with

[Issued 29 December.]

brown tips. Possibly it may prove to be a variety of *A. strobiliformis*, but it appears to be distinct.

Amanitopsis parcivolvata

Pileus rather thin, hemispherical or convex, becoming nearly plane, glabrous or sometimes adorned with a few small easily separable fragments of the volva, viscid when moist, plicate striate on the margin, orange or yellow, sometimes orange in the center and yellow or whitish on the margin, flesh white tinged with orange, reddish under the cuticle; lamellae free, rounded at the outer extremity, floccose on the edge, pale yellow; stem long, equal or slightly tapering upward, slightly furfuraceous or mealy, stuffed or hollow, pale yellow, rarely fading to white, the volva thin, easily rupturing and forming scales or disappearing, white; spores broadly elliptic, 10–12 μ long, 6–8 μ broad.

Pileus 5–10 cm. broad; stem 8–12 cm. long, 8–12 mm. thick.

Grassy ground in thin woods. New Jersey. July. Miss N. L. Marshall. North Carolina. July. Miss M. L. Wilson.

A beautiful mushroom. Sometimes the whole pileus is brilliant orange. In the North Carolina specimens the center of the pileus is orange or crimson and the margin yellow or whitish. The volva is so slight and so easily destroyed that it is difficult to secure specimens that retain it.

Lepiota felinoides

Pileus thin, convex, subumbonate, brown, purplish brown or blackish brown, often darker in the center, becoming squamose by the rupturing of the cuticle, flesh white; lamellae thin, close, free, white; stem slender, slightly thickened at the base, hollow, silky fibrillose, white, the annulus membranaceous, persistent, white; spores elliptic, 6–7.5, μ long, 4–5 μ broad.

Pileus 2.5–6 cm. broad; stem 5–8 cm. long, 2–4 mm. thick.

Low shaded ground under poison ivy in woods. Near St. Louis, Missouri. August. N. M. Glatfelter.

The species is related to *L. felina*, from which it is separated by its slender silky white stem and its well-developed persistent white annulus.

Armillaria macrospora

Pileus fleshy, fragile, convex, glabrous, viscid when moist, shining when dry, white, sometimes brown in the center, flesh white; lamellae rather narrow, close, decurrent, white; stem short,

stout, subequal, white, the annulus thick, white; spores oblong or subfusiform, 12–15 μ long, 6–8 μ broad.

Pileus 5–20 cm. broad; stem 2.5–5 cm. long, 12–20 mm. thick.

Single or cespitose. Dense spruce woods. Colorado. September. E. Bartholomew.

The white color and long spores are prominent characters of this species.

Armillaria solidipes

Pileus fleshy, convex, even, glabrous, tawny or yellowish brown, becoming tinged with red in drying, flesh whitish; lamellae rather close, adnate or slightly decurrent, white or whitish; stem long, firm, solid, colored like the pileus.

Pileus 2.5–5 cm. broad; stem 10–25 cm. long, 6–12 mm. thick.

Densely cespitose. About spruce stumps. Colorado. September. E. Bartholomew. Spores not seen.

Tricholoma Davisiae

Pileus fleshy but thin except in the center, very fragile, at first rounded with involute margin, becoming convex or nearly plane, umbonate, dry, pruinose or slightly pulverulent, floccose squamulose toward the margin, bright yellow when young and often tinged with red or green and showing changeable or iridescent hues, becoming paler with age and assuming pinkish or salmon tints, brown or purplish brown in the center, flesh white, taste farinaceous, then disagreeable; lamellae broad, subdistant, rounded behind and somewhat ventricose, adnexed, often split on the margin, whitish becoming tinged with salmon, specially on the edge; stem nearly equal, straight or curved, stuffed or slightly hollow, fibrous, penetrating the earth deeply, white externally and within; spores broadly elliptic or subglobose, 5–6 μ long, 5 μ broad.

Pileus 4–10 cm. broad; stem 5–10 cm. long, 8–15 mm. thick.

Among fallen leaves in pine woods. Near Falmouth, Maine. October and November. Mrs. H. C. Davis.

This is one of the most beautifnl species of *Tricholoma* known to me. Its changeable hues when young and fresh and its delicate salmon tints when mature make it very attractive. Its pileus is so fragile that care is necessary in collecting it to prevent breaking. The thin margin is often split. The umbo may be blunt or acute. It is brown like the center of the pileus. The lamellae

are sometimes marked by transverse white stripes. The species belongs to the section *Genuina* and is respectfully dedicated to its discoverer who kindly communicated notes and specimens.

Omphalia subclavata

Pileus thin, submembranaceous, subclavate or tubaeform, deeply umbilicate, glabrous, grayish brown; lamellae subdistant, very decurrent, yellow; stem slender, subpruinose, often tomentose near the base, hollow, whitish; spores elliptic, 6–7.5 μ long, 4–5 μ broad.

Pileus 6–12 mm. broad; stem about 2.5 cm. long, 1 mm. thick.

Dead bark. Missouri. July and August. N. M. Glatfelter.

This species differs from *O. clavata* in its yellow lamellae and elliptic spores and from *O. tubaeformis* in its yellow lamellae, whitish stem and longer spores.

Boletus roseotinctus

Pileus broadly convex or nearly plane, firm, dry, pruinose, pink or pale rosy red, flesh yellowish white; tubes short, adnate, yellowish, their mouths minute, subrotund, the dissepiments uneven on the edge; stem equal, even, yellow above, red or purplish red below; spores oblong, 10–12 μ long, 4–5 μ broad.

Pileus about 5 cm. broad; stem 3–5 cm. long, 8–12 mm. thick.

Blue Ridge. July and August. G. F. Atkinson.

The pileus is firm in the mass but its flesh is soft to the touch and almost friable. It is separable into two strata, the lower being thinner than the other. It belongs to the section *Subpruinosi*.

Boletus amabilis

Pileus fleshy, convex, glabrous, reddish tawny, flesh pallid; tubes short, decurrent to the annulus, yellow, their mouths angular; stem equal or slightly tapering downward, solid, paler than the pileus, reticulate above the slight annulus.

Pileus 5–18 cm. broad; stem 2.5–5 cm. long, 8–16 mm. thick.

Dense spruce woods. Colorado. September. E. Bartholomew.

In the dried specimens the pileus is marked with small brown or blackish brown spots. The tubes have a radiating structure as in the genus *Boletinus*, to which genus the species may possibly belong, but it is not safe to affirm such relationship from the dried

specimens. If a true *Boletus* it is nearest the section *Viscipelles* and the pileus is probably viscid when fresh though the dried specimens seen do not show this character, nor do the notes accompanying them speak of it. The annulus is slight and whitish.

Boletinus castanellus

Pileus convex or nearly plane, dry, subtomentose, soft, spongy, dark chestnut, flesh whitish or yellowish white; tubes nearly plane in the mass, adnate or slightly decurrent, brown, their mouths large, angular; stem short, solid, glabrous, colored like the pileus, whitish or grayish within, slightly reticulate at the top; spores 7.5–10 μ long, about 5 μ broad.

Pileus 2.5–4 cm. broad; stem about 2.5 cm. long, 4–8 mm. thick.

Woods. New Jersey. September. E. B. Sterling.

Studies on the Rocky Mountain Flora.—III

By P. A. Rydberg

SOME SMALLER GENERA OF COMPOSITES

STENOTUS Nutt.

This genus was established by Nuttall in 1840. It was retained as a genus by Torrey and Gray in their Flora, but merged with several others into *Aplopappus* by Gray in his Synoptical Flora. A few years ago (1894), Professor Greene reëstablished the genus, removing from it, however, a member erroneously placed in the genus by Torrey and Gray, viz., *Stenotus pygmaeus* Torrey and Gray (*Aplopappus pygmaeus* Gray), which he referred to *Macronema*.* If such a transfer was the very best is questionable, for that species is as much a stranger in *Macronema* as it is in *Stenotus*. It has the outer bracts foliaceous and the style-appendages long and attenuated which are characters found in *Macronema;* but the habit is very unlike *Macronema* and the outer foliaceous bracts are numerous as in *Pyrrocoma*. I had some transient thought of transferring it to that genus; but the purely white pappus, the densely cespitose habit, and the lack of the thick taproot, debar it from *Pyrrocoma*. These characters ally it to *Solidago;* but the difference in structure of the outer and the inner bracts makes it unnatural to place it there as well. It is very hard to decide which would be the best course to take, either to place it as an anomalous member of one of these genera or to make it the type of a new genus. Perhaps some other and better relationship may be found.

Of the other species included in Aplopappus § Stenotus by Gray, *A. Parryi* is, I think, rightly referred to *Solidago*. *A. Lyallii* was altogether omitted by Professor Greene, when he made the segregation in Pittonia. He may have overlooked this, but it is more probable that he omitted it, because he did not know where to place it. The relationship is without any doubt closest with *Solidago*, notwithstanding the solitary head.

* In a recent distribution of plants from Colorado determined by Professor Greene, this was distributed under its original name *Stenotus pygmaeus*.

By removing *Stenotus linearifolius* Torr. & Gray and *S. interior* Greene, which constitute a good genus, the genus *Stenotus* becomes a very natural one, with only one somewhat aberrant member, *S. lanuginosus* which approaches *Pyrrocoma inuloides* and its relatives in habit.

The Rocky Mountain species are distinguished as follows:

Plant glabrous or puberulent; leaves firm and evergreen.
- Leaves linear to filiform. — 1. *S. stenophyllus.*
- Leaves mostly oblanceolate.
  - Bracts lanceolate, acute.
    - Plant puberulent.
      - Bracts in 3 series, broad, with broad scarious margins. — 2. *S. acaulis.*
      - Bracts in 2 series, narrow, with narrow scarious margins. — 3. *S. Andersonii.*
    - Plant glabrous.
      - Stem-leaves oblanceolate, 1–2 cm. long. — 4. *S. caespitosus.*
      - Stem-leaves linear, 4–7 cm. long. — 5. *S. falcatus.*
  - Bracts oval or oblong, very obtuse. — 6. *S. armerioides.*

Plant floccose; leaves softer, not evergreen. — 7. *S. lanuginosus.*

1. STENOTUS STENOPHYLLUS (A. Gray) Greene, Erythea, **2**: 72. 1894

Aplopappus stenophyllus A. Gray, U. S. Expl. Exp. **17**: 347. 1862–74.

This species grows on stony hills and mountains and ranges from western Idaho and Washington to California.

2. STENOTUS ACAULIS Nutt. Trans. Am. Phil. Soc. II. **7**: 334. 1840

Chrysopsis acaulis Nutt. Journ. Phil. Acad. **7**: 33. 1834.

Aplopappus acaulis A. Gray, Proc. Am. Acad. **7**: 353. 1867.

This is a rather common species, growing on dry rocky hills and mountains at an altitude of 1000–2500 m., from Saskatchewan and Washington to Wyoming and California.

3. **Stenotus Andersonii** sp. nov.

A puberulent, cespitose, but less woody perennial than the preceding and the three next following species. Flowering stems about 1 dm. high, leafy at the base, few-leaved above: leaves narrowly oblanceolate, not very rigid, distinctly 3-ribbed, 3–5 cm. long, 3–4 mm. wide: bracts narrowly lanceolate, acute, glandular

puberulent, with a very narrow scarious margin, imbricated in 2 series: achenes somewhat fusiform, about 4 mm. long, grayish or white villous as in the other species.

This species is nearest related to the preceding, but characterized by the less rigid leaves, the fewer and narrower involucral bracts, the involucre being more that of *S. lanuginosus*.

The type was collected on dry open hills.

MONTANA: Belt Mountains, 1886, *F. W. Anderson, 3561.**

4. STENOTUS CAESPITOSUS Nutt. Trans. Am. Phil. Soc. II. **7**: 335. 1840

Chrysopsis caespitosa Nutt. Jour. Acad. Phila. **7**: 33. 1834.

Aplopappus acaulis var. *glabratus* D. C. Eaton, King's Exped. **5**: 161. 1871.

This grows on dry hills and mountains, at an altitude of 1000–3000 m., from Montana and Idaho to Nevada, Arizona and Wyoming.

5. **Stenotus falcatus** sp. nov.

A glabrous cespitose perennial, with a woody caudex, resembling *S. armerioides* in habit. Flowering stems 10–15 cm. high, leafy, 1–3-cephalous: basal leaves oblanceolate, rigid, obtuse or acute, 4–5 cm. long, 4–6 mm. wide, 3-ribbed; stem leaves linear, 4–7 cm. long, 2–3 mm. wide, more or less falcate: heads about 1 cm. high: bracts lanceolate, acute, with scarious margin: rays 6–7 mm. long, 2.5–3 mm. wide.

This species differs from *S. armerioides*, which it closely resembles in the narrower and acute involucral bracts. It grows in barren soil at an altitude of about 1500 m.

UTAH: Red Creek, 1877, *Dr. E. Palmer, 202* (type); Milford, 1880, *M. E. Jones, 1804.*

6. STENOTUS ARMERIOIDES Nutt. Trans. Am. Phil. Soc. II. **7**: 335. 1840

Aplopappus armerioides A. Gray, Syn. Fl. **1**^{2}: 132. 1884.

This species grows on dry hills and bad-lands, at an altitude of 1000–2000 m., from Manitoba and Assiniboia to Utah, New Mexico and western Nebraska.

* Unless otherwise stated, the types of the new species described are preserved in the herbaria of the New York Botanical Garden or of Columbia University.

7. STENOTUS LANUGINOSUS (A. Gray) Greene, Erythea, **2**: 72. 1894.

Aplopappus lanuginosus A. Gray, U. S. Expl. Exped. **17**: 347. 1862–74.

This species is a rather anomalous member of the genus, as the leaves are not rigid, and scarcely evergreen. In habit it resembles somewhat some species of *Pyrrocoma*, as for instance, *P. inuloides;* but it has the thin involucral bracts and the white pappus of *Stenotus*. It grows on the mountains of Washington, northern Idaho and Montana.

Stenotopsis gen. nov.

Low shrubs with fastigiate branches, narrow fasciculate glandular punctate leaves and large peduncled heads. Involucre broadly hemispherical; its bract subequal, almost in a single series, linear lanceolate, thin scarious-margined, not at all hebaceous. Receptacle naked, alveolar. Ray-flowers about 12, ligulate, yellow, large, pistillate and fertile. Disk-flowers perfect: their corollas tubular-trumpet shaped, deeply 5-lobed. Anthers obtuse at the base. Style branches stigmatic their whole length, with ovate to lanceolate-subulate appendages. Achenes densely silvery-villous. Pappus of white capillary bristles, rather deciduous.

The genus contains two known species. It differs mainly from *Stenotus* in its shrubby habit and glandular punctate leaves.

Leaves 3–4 cm. long; rays 11–14 mm. long.	1. *S. linearifolius.*
Leaves 1–2 cm. long; rays 9–11 mm. long.	2. *S. interior.*

1. **Stenotopsis linearifolia** (DC.)

Aplopappus linearifolius DC. Prod. **5**: 347. 1836.

Stenotus linearifolius Torr. & Gray, Fl. N. Am. **2**: 238. 1842.

This species is a shrub 3–10 dm. high, and grows on dry hills, from Utah to California and Arizona.

2. **Stenotopsis interior** (Coville)

Aplopappus interior Coville, Proc. Biol. Soc. Wash. **7**: 65. 1892.

Stenotus interior Greene, Erythea, **2**: 72. 1892.

Its range is further southwest, from southern Utah to Arizona and southern California.

MACRONEMA Nutt.

This genus was also established by Nuttall in 1840 and re-established by Greene. The latter included, as is stated before, also *Stenotus pygmaeus* Nutt. (*Aplopappus pygmaeus* A. Gray). As the relationship of that species is rather doubtful, I have not included it in the treatment below. The species can be separated as follows:

Heads radiate.	
Heads small, fastigiate clustered; disk 5–8 mm. in diameter.	
Leaves broadly obovate, mucronate-cuspidate.	1. *M. obovatum.*
Leaves oblanceolate, acute or pointed.	2. *M. Watsonii.*
Heads larger, solitary: disk 1 cm. or more in diameter.	
Leaves oblanceolate, acute.	3. *M. suffruticosum.*
Leaves spatulate, obtuse or mucronate.	4. *M. grindelifolium.*
Heads discoid.	
Leaves oblong-oblanceolate.	
Outer bracts oblong, acute.	5. *M. discoideum.*
Outer bracts broadly oblong, obtuse.	6. *M. obtusum.*
Leaves linear.	7. *M. lineare.*

1. **Macronema obovatum** sp. nov.

A glandular-puberulent undershrub, 2–3 dm. high, with light yellow bark on the branches. Leaves broadly obovate, 1–2 cm. long, 7–10 mm. wide, mucronate-cuspidate: heads usually 2–3 together, about 10 mm. high, and 8 mm. broad: its bracts firmer than in the other species, oblong-linear, abruptly obcuneate-acute at the apex, unequal, imbricated in about 4 series: rays short, 4–5 mm. long and 1–1.5 mm. wide, about 10 in number.

The species is nearest related to *M. Watsonii*, differing mainly in the broad leaves and the abruptly acute bracts. The type was collected at an altitude of 1600 m.

UTAH: City Creek Cañon, *M. E. Jones, 1081.*

2. MACRONEMA WATSONII (A. Gray) Greene, Erythea, **2**: 74. 1894

Aplopappus Watsonii A. Gray, Proc. Am. Acad. **16**: 79. 1881.

This grows on mountains at an altitude of 2000–2500 m., in Utah and Nevada.

3. MACRONEMA SUFFRUTICOSUM Nutt. Trans. Am. Phil. Soc. II. **7**: 322. 1840

Aplopappus suffruticosus A. Gray, Proc. Am. Acad. **6**: 542. 1865.

This species grows in the mountains of Oregon and California up to an altitude of 3000 m. It has also been reported from Wyoming, but possibly some specimens of the next have been mistaken for it.

4. MACRONEMA GRINDELIOIDES Rydberg, Mem. N. Y. Bot. Garden, **1**: 384. 1900

The habitat of this species is rocky places on mountain-sides, at an altitude of 2500–3000 m. It grows in Montana, Idaho and northern Wyoming.

5. MACRONEMA DISCOIDEUM Nutt. Trans. Am. Phil. Soc. II. **7**: 322. 1840

Aplopappus Macronema A. Gray, Proc. Am. Acad. **6**: 542. 1864.

This species grows on the higher mountains at an altitude of 2500–3000 m., from Wyoming and Colorado to California.

6. **Macronema obtusum** sp. nov.

A dense glandular-pubescent undershrub, 2–4 m. high, with white-tomentose branches. Leaves oblong-oblanceolate, about 3 cm. long and 6 mm. wide, obtuse or mucronate: heads about 18 mm. high, 10–18 mm. in diameter: their bracts linear, acute, scarcely more than half as long as the flowers, subequal, except the outermost, which are foliaceous, broadly oblong, obtuse or mucronate: rays none.

The species is closely related to the preceding, differing in the stouter habit and the larger and broader, more obtuse outer bracts. It grows on high mountains at an altitude of about 2500 m.

COLORADO: South Cottonwood Gulch, 1892, *C. S. Sheldon, 5838* (type); Twin Lakes, 1873, *John Wolfe, 451.*

7. MACRONEMA LINEARE Rydb. Mem. N. Y. Bot. Garden, **1**: 384. 1900

In habit, this species resembles some species of *Chrysothamnus* and Prof. Aven Nelson insists that it should be referred to that genus. It has, however, the foliaceous outer bracts and long style-appendages of *Macronema* and is clearly congeneric with the two preceding species. It cannot very well be referred to *Chrysothamnus*, for it lacks the most essential character of the genus, viz., the

arrangement of the involucral bracts in distinct vertical rows. It grows in gravelly places in northern Wyoming, at an altitude of 2000–2500 m.

SIDERANTHUS Fraser

The name *Sideranthus* appears first in Fraser's Catalogue, but there only as a nomen nudum. Pursh in his Flora on page 750 gives *Sideranthus integrifolius* Fraser and *S. pinnatifidus* Fraser as synonyms of *Amellus villosus* and *A. spinulosus* described on page 564. There may be a doubt as to which of these should be regarded as the type of *Sideranthus*. *Amellus villosus* with its relatives was made a genus *Chrysopsis* by Nuttall in 1818 or by Elliott in 1824, according to different interpretations, long before *Eriocarpum* was established (1840). This leaves *Sideranthus pinnatifidus* as the residue of the genus *Sideranthus*. Besides Nuttall, who was the real author of Fraser's Catalogue, made *Sideranthus* a subgenus of *Dieteria* containing the only species *D. spinulosa* (*Aplopappus spinulosus* DC. See Trans. Am. Phil. Soc. II. **7**: 301); and thus shows that he regarded it as the type of *Sideranthus*.*

Leaves spinescent toothed, not pinnatifid.
- Heads discoid; perennial with woody caudex. 1. *S. grindelioides.*
- Heads radiate; annual. 2. *S. rubiginosus.*

Leaves pinnatifid.
- Stem more or less floccose, or cinereous especially when young.
  - Plant cinereous pubescent, more or less glandular. 3. *S. australis.*
  - Plant more or less floccose, not at all glandular. 4. *S. spinulosus.*
- Plant neither floccose nor cinereous.
  - Plant perfectly glabrous or sparingly glandular puberulent. 5. *S. glaberrimus.*
  - Plant finely puberulent.
    - Heads hemispherical; bracts slightly glandular. 6. *S. puberulus.*
    - Heads somewhat turbinate; bracts densely glandular puberulent. 7. *S. turbinellus.*

1. **Sideranthus grindelioides** (Nutt.) Britton

Eriocarpum grindelioides Nutt. Trans. Am. Phil. Soc. II. **7**: 321. 1840.

Aplopappus Nuttallii Torr. & Gray, Fl. N. A. **2**: 240. 1842.

* Professor Greene (Pittonia **2**: 115) seems to think *Sideranthus* is derived from the Latin *sidus*, star, and the Greek, *ανθος*, flower. It is better to regard the first part also as Greek, *σιδήρος*, iron. Why accuse Nuttall of making a hybrid word, which we would not permit ourselves?

The species is not uncommon on barren hills and in bad-lands, up to an altitude of 1500 m. Its range extends from Saskatchewan and western Nebraska to Colorado and Arizona.

2. **Sideranthus rubiginosus** (Torr. & Gray) Britton

Aplopappus rubiginosum Torr. & Gray, Fl. N. Am. **2**: 240. 1842.

Eriocarpum rubiginosum (Torr. & Gray) Britton, Mem. Torr. Bot. Club, **5**: 316. 1894.

The species was first described as a perennial. Our plant is evidently only annual. Possibly two different species have been confused under the name *E. rubiginosum*. It grows in sandy soil from Texas to Colorado and western Nebraska, reaching an altitude of 1500 m.

3. **Sideranthus australis** (Greene)

Eriocarpum australe Greene, Erythea, **2**: 108. 1894.

This grows on the plains of western Texas, Colorado, New Mexico and Mexico.

4. SIDERANTHUS SPINULOSUS (Pursh), Sweet, Hort. Brit. 227. 1826

Amellus spinulosus Pursh, Fl. Sept. Am. 564. 1814.

Sideranthus pinnatifidus Fraser; Pursh, Fl. Am. Sept. 750. 1814

Aplopappus spinulosus DC. Prod. **5**: 347. 1836.

Eriocarpum spinulosum (Pursh) Greene, Erythea, **2**: 108. 1894.

The species is rather common on plains and dry prairies, from Saskatchewan, Nebraska and Texas to Mexico, Arizona and Idaho.

5. **Sideranthus glaberrimus** sp. nov.

Perennial, with a short woody caudex, perfectly glabrous, or very sparingly glandular-puberulent. Stems several, branched above, very leafy, 1–3 dm. high: leaves rather rigid, about 2 cm. long, bluish green, glabrous, pinnatifid; segments oblong, 2–5 mm. long and 1 mm. or less wide, spinulose-tipped: heads numerous, corymbose, depressed hemspherical, 8–10 mm. high and 8–15 mm. broad: bracts imbricated in 6–7 series, the outer gradually shorter, firm, appressed, with a herbaceous tip, acute; the inner tinged with purplish: rays about 20, 4–5 mm. long and about 1 mm. wide.

The species is closely allied to the preceding, differing mainly in the total lack of tomentum, even when young, the bluer color and the smaller, generally purple-tinged bracts. It grows on plains and hills, from Iowa and Indian Territory to New Mexico and Wyoming.

KANSAS: Osborn City, 1894, *C. L. Shear, 116;* Harper, 1888, *W. A. Kellerman;* Hamilton Co., 1895, *Hitchcock, 222.*

NEBRASKA: 1893, *Rydberg, 1403a* (type); *G. D. Sweezey, 55.*

INDIAN TERRITORY: 1868, *Edward Palmer, 442.*

COLORADO: Platte, *Dr. James.*

WYOMING: Platte, *Fremont,* Dayton, 1899, *Tweedy, 2076.*

6. **Sideranthus puberulus** sp. nov.

A low densely puberulent perennial, less than 1.5 dm. high: Stems ascending, branched above: leaves 2–3 cm. long, pinnatifid or bipinnatifid; segments 1–5 mm. long, less than 1 mm. wide, spinulose-tipped: heads 2–4 in a small corymb, hemispherical, 8–9 mm. high, 10–12 mm. broad: bracts narrowly linear-lanceolate, appressed, acute, with small herbaceous tips, finely puberulent, but only slightly glanular: rays about 20, 8–9 mm. long and about 1.5 mm. wide.

This is perhaps nearest related to *E. australe;* but is easily distinguished by the fine pubescence.

COLORADO: Salida, *Mrs. C. B. Clarke, 174.*

7. **Sideranthus turbinellus** sp. nov.

A low and bushy puberulent perennial, 1.5–2 dm. high. Stems corymbosely branched and very leafy: leaves .5–2 cm. long, pinnatifid or the upper reduced and merely toothed; segments narrow, 1–5 mm. long, about .5 mm. wide: heads numerous, small, hemispherical-turbinate, 7–8 mm. high, and scarcely as broad: bracts imbricated in 6–7 series, linear-lanceolate, acute, appressed glandular-puberulent: rays 10–15, 7–8 mm. long and 1.5 mm. wide.

Perhaps nearest related *E. spinulosum,* the species is easily known by the small, somewhat turbinate heads and the dense and fine pubescence.

IDAHO: Pocatello, 1892, *A. Isabel Mulford.*

PYRROCOMA Hook.

This genus was established by Hooker in 1840, and based on one species, *P. carthamoides.* In 1894, Professor Greene extended the genus so as to include the genus *Homopappus* of Nuttall, the difference between the two genera being only that the ligules of the ray-flowers in the former are very small and inconspicous or wanting.

Heads apparently discoid, the sterile rays being concealed in the pappus.
Inner bracts recurved cuspidate. 1. *P. subsquarrosa.*
Bracts not recurved cuspidate.
Bracts oblong or oval; heads hemispherical.
Leaves and bracts more or less spinulose-toothed, the latter with a narrow scarious margin. 2. *P. carthamoides.*
Leaves and bracts not spinulose-toothed, the latter with a broad scarious erose margin.
Pappus sordid; plant almost glabrous. 3. *P. rigida.*
Pappus brownish red; plant villous. 4. *P. erythropappa.*
Bracts lanceolate; head campanulate-turbinate. 5. *P. Cusickii.*
Heads distinctly radiate.
Bracts except the innermost obtuse, obovate or oblong. 6. *P. crocea.*
Bracts mostly acute or acuminate.
Plant not glandular.
Heads large; disk 2 cm. or more in diameter; bracts in about 3 series.
Upper part of stem and involucre decidedly villous; bracts wholly foliaceous.
Bracts oblanceolate, abruptly acute. 7. *P. Clementis.*
Bracts lanceolate, long-acute. 8. *P. villosa.*
Stem and involucre almost glabrous; bracts chartaceous at the base with foliaceous tips. 9. *P. integrifolia.*
Heads smaller; disk less than 2 cm. in diameter.
Bracts in 2–3 unequal series.
Leaves 5–15 mm. wide; disk 1–2 cm. wide.
Inflorescence corymbiform; bracts long-acute. 10. *P. lanceolata.*
Inflorescence racemiform; bracts abruptly acute. 11. *P. Vaseyi.*
Leaves 2–4 mm. wide; disk 1 cm. or less wide. 12. *P. tenuicaulis.*
Bracts nearly of the same length.
Stem-leaves oblanceolate; bracts long-acuminate. 13. *P. acuminata.*
Stem-leaves lanceolate; bracts acute or short-acuminate.
Plant villous. 14. *P. inuloides.*
Plant, except the upper parts, glabrate in age. 15. *P. uniflora.*
Plant decidedly glandular. 16. *P. hirta.*

1. PYRROCOMA SUBSQUARROSA Greene, Erythea, 3: 22. 1895

I have seen no specimen of this species; but the description indicates a plant wholly unlike the other species of the Rocky Mountains, that I do not hesitate in accepting it as a good species. The type of *P. subsquarrosa* was collected in northern Wyoming, by Dr. J. N. Rose in 1893.

2. PYRROCOMA CARTHAMOIDES Hook. Fl. Bor. Am. 1: 307. 1833

Aplopappus carthamoides A. Gray, Proc. Acad. Sci. Phila. 1863: 65. 1864.

As treated by Dr. Gray, *A. carthamoides* comprises more than one species, and probably both of the two following species are covered by his description. There is no doubt, however, as to which species shall bear the name, for Hooker's description and figure point clearly to the plant with more or less spinulose-toothed leaves and bracts. The latter are also longer, narrower and more acute than in the other two species. *P. carthamoides* ranges from Alberta and British Columbia to Oregon and Idaho.

3. **Pyrrocoma rigida** sp. nov.

A perennial with a thick woody tap-root. Stems 1–3, erect or ascending, finely pubescent when young, glabrate in age, 2–4 cm. high, leaves pale bluish green, firm, oblanceolate, acute, entire-margined, finely puberulent, or glabrate; the lower petioled, 8–15 cm. long, 1.5–3 cm. wide; the upper smaller and sessile: heads apparently discoid, 15–20 mm. high, 15–25 mm. broad: bracts very firm, imbricated in 3–4 series, broadly oblong, acute or mucronate; the inner at least with broad scarious or semi-chartaceous margins, which generally are erose, but not spinulose-dentate: ligules of the ray-flowers erect, slightly longer than the light brownish or sordid pappus: achenes glabrous, shining.

In general habit, this species resembles closely *P. carthamoides* but has broader leaves and bracts, paler foliage and no indication of spinulose toothing. It grows in sandy places and meadows in Idaho, Montana and Washington.

IDAHO: Granite Station, Kotenay County, 1892, *Sandberg, MacDougal & Heller, 785* (type).

MONTANA: Columbia Falls, 1894, *R. S. Williams.*

WASHINGTON: Loomiston, 1897, *A. D. E. Elmer, 603.*

4. **Pyrrocoma erythropappa** sp. nov.

A finely villous pubescent perennial. Stem 1.5–3 dm. high, with 1–4 heads: stem-leaves 3–6 cm. long, 1–1.5 cm. wide, firm, oblanceolate or oblong, acute, subsessile, finely pubescent, or glabrate on the upper surface: heads very short-peduncled in the axils of the upper leaves, 10–15 mm. high, about 15 mm. in diameter: bracts imbricated in 4–5 series, pubescent, broadly oval or oblong, obtuse, mucronate, or the outer acute, with a thin erose margin: pappus intensely brownish red: otherwise as the preceding.

IDAHO: Clear Water, *Rev. Spalding* (type in Torrey Herbarium).

5. PYRROCOMA CUSICKII (A. Gray) Greene, Erythea, **2**: 59. 1894

Aplopappus carthamoides var. *Cusickii* A. Gray, Syn. Fl. **2**[1]: 126. 1886.

The range of this species is limited to Oregon and western Idaho.

6. PYRROCOMA CROCEA (A. Gray) Greene, Erythea, **2**: 69. 1894

Aplopappus croceus A. Gray, Proc. Acad. Sci. Phila. 1863: 65. 1864.

This species is not uncommon in the mountain regions of Colorado at an altitude of 1800–3000 m.

7. **Pyrrocoma Clementis** sp. nov.

A perennial with more or less villous ascending stem, 1.5–4 dm. high: lower stem-leaves linear-oblong, about 1 dm. long, somewhat fleshy, glabrous except the ciliate margin, saliently dentate; the upper lanceolate or ovate-lanceolate, more or less auricled at the base, dentate or entire-margined; heads solitary; disk about 15 mm. high and 2.5–3 cm. broad: bracts all foliaceous, imbricated in 3–4 series, but the outer almost equaling the inner, oblanceolate, abruptly acute, villous: rays 10–12 mm. long and 2–3 mm. wide, bright yellow: achenes sparingly strigose-hirsute: pappus yellowish white.

COLORADO: Mt. Harvard, 1896, *Frederick Clements, 44.*

8. **Pyrrocoma villosa** sp. nov.

A low perennial with a thick woody tap-root. Stems 1–3, ascending, 1–1.5 dm. high, purplish, more or less villous, especially above: basal leaves oblanceolate, 7–10 cm. long, 1–1.5 cm. wide, somewhat glaucous and rigid, entire-margined or occasionally slightly spinulose denticulate; stem-leaves linear-lanceolate, 2–4 cm. long: heads solitary: disk about 2 cm. broad: bracts foliaceous, imbricated in 3–4 series, but the outer fully as long as the inner, broadly linear or lanceolate, long-acute, more or less villous: rays about 1 cm. long and 2 mm. wide: achenes glabrous: pappus dirty white.

In habit this species resembles most *P. uniflora* and *P. inuloides;* but is easily distinguished by the larger heads and the foliaceous bracts in several series. It grows in meadows at an altitude of about 2700 m.

WYOMING: Willow Creek, Big Horn Mountains, 1899, *F. Tweedy, 2063.*

9. PYRROCOMA INTEGRIFOLIA (Porter) Greene, Erythea, **2**: 69. 1894

Aplopappus integrifolius Porter; A. Gray, Proc. Am. Acad. **16**: 79. 1881.

This species grows in meadows, at an altitude of 1000–2500 m., from Saskatchewan to Idaho and Wyoming.

Pyrrocoma integrifolia pumila var. nov.

Pyrrocoma Howellii Rydb. Mem. N. Y. Bot. Garden, **1**: 382. 1900. Not A. Gray.

Stem low, 1 dm. or less, monocephalous; bracts shorter and less acute.

MONTANA: Butte, 1895, *Rydberg, 2808.*

10. PYRROCOMA LANCEOLATA (Hooker) Greene, Erythea, **2**: 69. 1894

Donia lanceolata Hook. Fl. Bor. Am. **2**: 25. 1834.

Aplopappus lanceolatus Torr. & Gray, Fl. N. Am. **2**: 241. 1842.

The range of this species is from Saskatchewan to British Columbia, Nevada and Wyoming. It ascends to an altitude of 2000 m.

11. **Pyrrocoma Vaseyi** (Parry)

Aplopappus lanceolatus var. *Vaseyi* Parry; D. C. Eaton, King's Exped. **5**: 160. 1871.

I believe that this deserves a specific rank, as the racemose disposition of the heads is accompanied with shorter, closer and oblanceolate, abruptly acute bracts. It ranges from Saskatchewan (according to Gray) south to Utah and Colorado.

12. PYRROCOMA TENUICAULIS (D. C. Eaton) Greene, Erythea, **2**: 69. 1894

Aplopappus tenuicaulis D. C. Eaton, King's Exped. **5**: 160. 1871.

Aplopappus lanceolatus var. *tenuicaulis* A. Gray, Syn. Fl. **2**[1]: 129. 1884.

This grows in alkali meadows of Utah, Nevada and Oregon, at an altitude of about 2000 m.

13. **Pyrrocoma acuminata** sp. nov.

A low finely villous perennial with a woody tap-root. Stems several, slender, about 1 dm. high, monocephalous: leaves nar-

rowly linear-oblanceolate, with strong midrib, 2–4 cm. long, 2–4 mm. wide, entire-margined, acute, finely villous on both sides: heads on naked peduncles, which are 3–4 cm. long: disk about 1 cm. high and 12–15 mm. broad: bracts in about 2 series, broadly lanceolate, contracted into a long slender tip: rays about 1 cm. long and 1.5 mm. wide: achenes pubescent: pappus tawny.

In habit this species resembles most *P. inuloides*, but differs in the smaller leaves, the shorter pubescence and the acumination of the bracts.

WYOMING: Fort Bridger, 1873, *Dr. J. V. Carter* (type in Columbia Herbarium).

14. PYRROCOMA INULOIDES (Hook.) Greene, Erythea, **2**: 60. 1894

Donia inuloides Hook. Fl. Bor. Am. **2**: 25. 1834.

Aplopappus inuloides Torr. & Gray, Fl. N. Am. **2**: 241. 1842.

Dr. Gray included this in *A. uniflorus*, but I agree with Professor Greene that it ought to be kept distinct. It ranges from Montana to Idaho and Wyoming.

15. PYRROCOMA UNIFLORA (Hook.) Greene, Erythea, **2**: 60. 1894

Donia uniflora Hook. Fl. Bor. Am. **2**: 25. 1834.

Aplopappus uniflorus Torr. & Gray, Fl. N. Am. **2**: 241. 1842.

This species grows in alkaline meadows, up to an altitude of 2500 m., and ranges from Saskatchewan and Montana to Utah and Colorado.

16. PYRROCOMA HIRTA (A. Gray) Greene, Erythea, **2**: 69. 1894

Aplopappus hirtus A. Gray, Syn. Fl. **2**[1]: 127. 1884.

The range of this species includes eastern Oregon, Washington and western Idaho, where it reaches an altitude of 1000 m.

BALSAMORRHIZA Hook.

Leaves entire or bluntly toothed, never pinnatifid.

Plant white-tomentose.

Leaves with entire margins or slightly undulate, oblong-cordate to hastate. 1. *B. sagittata.*

Leaves more or less distinctly toothed, ovate-lanceolate, with subcordate base. 2. *B. tomentosa.*

Plant hirsute puberulent; basal leaves cordate.

Rays linear, deciduous; achenes glabrous. 3. *B. deltoidea.*

Rays oval, becoming papery, and more or less persistent: achenes puberulent. 4. *B. Careyana.*

Leaves mostly pinnatifid or at least incisedly toothed.
Plant canescent or white-tomentose.
Plants loosely white-tomentose.
Stem 1–3 dm. high; segments of the leaves 1–3 cm. long, ovate, entire or slightly toothed. 5. *B. incana.*
Stem 3 dm. or more high; segments of the leaves 3–5 cm. long, lanceolate, coarsely toothed. 6. *B. floccosa.*
Plant finely canescent, tomentose only on the involucre; some of the leaves merely toothed. 7. *B. terebinthacea.*
Plants more or less hispid, neither canescent nor tomentose.
Disk 3–4 cm. broad; segments of the leaves mostly entire. 8. *B. macrophylla.*
Disk 2–2.5 cm. broad; segments of the leaves mostly toothed. 9. *B. hirsuta.*

1. BALSAMORRHIZA SAGITTATA (Pursh) Nutt. Trans. Phil. Soc. II. 7: 350. 1840

Bupthalmium saggittatum Fl. Am. Sept. 564. 1814.

Growing on hillsides at an altitude of 1000–2500 m., this species is not uncommon from Alberta and British Columbia to California, Colorado and the Black Hills of South Dakota.

2. **Balsamorrhiza tomentosa** sp. nov.

A white-tomentose perennial with thick root; but the tomentum is shorter and finer than in *B. sagittata.* Basal leaves with long petioles; blades about 12 dm. long, ovate-lanceolate with subcordate bases, 15–20 cm. long, acute, coarsely toothed; stem-leaves generally two, including the slender petioles about 1 dm. long, lanceolate to linear elliptic, acute at both ends: stem 3–4 dm. high, involucre densely floccose, over 2 cm. broad: outer bracts half longer than the inner, reflexed: rays about 3 cm. long and 1 cm. wide; achenes glabrous.

Closely related to *B. sagittata* this species differs mainly in the toothed leaves, shorter tomentum and longer outer bracts.

WYOMING: Headwaters of Tongue River in the Big Horn Mountains, 1898, *F. Tweedy, 10.**

3. BALSAMORRHIZA DELTOIDEA Nutt. Trans. Am. Phil. Soc. II. 7: 351. 1840

The name of this plant is rather unfortunate, as the leaves are rarely deltoid, but on the contrary usually broadly cordate. *B. deltoidea* ranges from British Columbia to California and Idaho.

*A specimen collected by Tweedy on Teepee Creek in 1899 (*no. 2114*), may also belong here. It has smaller heads, not reflexed bracts and lanceolate leaves.

4. BALSAMORRHIZA CAREYANA A. Gray, Pl. Fendl. 81. 1849

This species grows on sandy plains of Idaho and Washington.

5. BALSAMORRHIZA INCANA Nutt. Trans. Am. Phil. Soc. II. **7**: 350. 1840

Balsamorrhiza Hookeri var. *incana* A. Gray, Syn. Fl. **2**[1]: 266. 1884.

This species grows on dry stony hills, up to an altitude of 2500 m., from Montana and Washington to California and Wyoming.

6. **Balsamorrhiza floccosa** sp. nov.

Balsamorrhiza Balsamorrhiza Rydb. Mem. N. Y. Bot. Garden, **1**: 417. 1900. Not *Heliopsis Balsamorrhiza* Hook.

A loosely white or gray-tomentose perennial with very thick tap-root. Leaves mostly basal, floccose on both sides, 2–3 dm. long, regularly pinnately divided to near the midrib: some sometimes only coarsely toothed: segments lanceolate, acute, 3–5 cm. long coarsely toothed: stem-leaves 2, near the base, similar but smaller, about 1 dm. long: stem scapiform, 3–5 dm. high, villous or the upper portion densely floccose: involucre about 3 cm. broad, densely floccose; bracts numerous in several series, lanceolate; the outer often spreading with recurved tips; rays 3–4 cm. long, about 1 cm. wide; achenes glabrous, cuneate oblong, with truncate apex.

This species has been mistaken for *B. Balsamorrhiza* (Hook.) Heller or *B. Hookeri* Nutt., but the latter has much finer dissected leaves and its pubescence is quite different. The latter is very short and appressed, never consisting of long villous hairs, and there is never dense wool at the base of the head as in this species. *B. Balsamorrhiza* ranges from Washington to California; but is evidently not found in the Rocky Mountain region. All that I have seen from the region and referred to *B. Balsamorrhiza* by Heller, Holzinger and myself belong to *B. floccosa*. Those collected by Parry, and if I am not mistaken, named by Gray, belong to *B. incana*.

B. floccosa grows on hillsides at an altitude of 1000–2500 m. The following specimens are in the New York herbaria:

MONTANA: Spanish Basin, Gallatin Co., 1897, *Rydberg & Bessey, 5175* (type).

IDAHO: Lake Waha, 1896, *A. A. & E. Gertrude Heller, 3298;*

Craig Mountain near Lake Waha, 1892, *Sandberg, MacDougal & Heller, 248.*

WYOMING: Headwaters of Tongue River, Big Horn Mountains, 1898, *F. Tweedy, 11.*

7. BALSAMORRHIZA TEREBINTHACEA (Hook.) Nutt. Trans. Am. Phil. Soc. II. **7**: 349. 1840

Heliopsis? terebinthacea Hook. Fl. Bor. Am. **1**: 310. 1833.

In this species, as well as in the next, it often occurs that some of the leaves are not pinnatifid, but merely coarsely dentate. It is a rare plant growing in stony soil in eastern Oregon and western Idaho.

8. BALSAMORRHIZA MACROPHYLLA Nutt. Trans. Am. Phil. Soc. II. **7**: 350. 1840

This grows on rocky hillsides in Wyoming, Utah and Idaho.

9. BALSAMORRHIZA HIRSUTA Nutt. Trans. Am. Phil. Soc. II. **7**: 349. 1840

This species is found at an altitude of 1000–2000 m. in the dry regions of Utah to British Columbia and California.

THELESPERMA Less.

Heads radiate.
- Leaf-segments linear-filiform, 1 mm. or less wide.
  - Annual or biennial; outer bracts subulate-linear, more than half as long as the inner. 1. *T. trifidum.*
  - Perennial from a rootstock: outer bracts linear-lanceolate, half as long as the inner or less. 2. *T. tenue.*
- Leaf-segments linear, over 1 mm. wide; plant perennial or the first only biennial.
  - Plant with tap-root, leafy throughout. 3. *T. intermedium.*
  - Plant with creeping rootstock or woody caudex; leafy only near the base.
    - Involucre not cleft below the middle; throat of the disk-flowers campanulate, shorter than the lobes. 4. *T. ambiguum.*
    - Involucre cleft below the middle; throat of the disk-flowers cylindraceous, longer than the lobes. 5. *T. subnudum.*

Heads discoid; perennials with rootstock or woody caudex.
- Plant less than 2 dm. high; involucre with very broad scarious margins. 6. *T. marginatum.*
- Plants 3–6 dm. high; involucre with very narrow scarious margins. 7. *T. gracile.*

1. THELESPERMA TRIFIDUM (Poir.) Britton, Trans. N. Y. Acad. Sci. **9**: 182. 1890

Coreopsis trifida Poir. Suppl. Lam. Encycl. **2**: 353. 1811.

Thelesperma filifolium A. Gray, Kew Journ. Bot. **1**: 253. 1849.

This species grows in dry soil from Nebraska to Texas and eastern Colorado.

2. **Thelesperma tenue** sp. nov.

A slender, glabrous plant with perennial rootstock. Stems 1–3, slender, less than 2 mm. in diameter, light green, mostly simple and leafy to near the top, 1.5–4 dm. high: leaves twice pinnately dissected into linear filiform segments, mostly appressed to the stem: peduncles 1–3, 5–10 cm. long: outer bracts 6–8, linear-lanceolate, half as long as the inner or less; the inner united to the middle, broadly scarious-margined: rays 8–12 mm. long, 4–6 mm. wide: awns of the pappus very short, about half as long as the width of the summit of the dark shining achenes.

This species resembles most the preceding but has a simpler stem and perennial rootstock. It grows in sandy soil at an altitude of about 2800 m.

COLORADO: Veta Pass, 1900, *Rydberg & Vreeland, 5473* (type); 1870, *Dr. G. W. Hulse:* Plains, 1871, *Wm. M. Canby.*

3. **Thelesperma intermedium** sp. nov.

A glabrous bushy plant with a biennial or perhaps perennial tap-root. Stems several, much branched and very leafy, 2–6 dm. high: leaves once or twice pinnately divided into linear segments, 1–3 mm. wide: peduncles very numerous, 1–1.5 dm. long: involucre about 1 cm. broad: outer bracts very narrowly linear-lanceolate, about half as long as the inner; these united to about the middle, scarious-margined: rays 10–12 mm. long, 6–8 mm. wide, rounded, 3-toothed at the apex: teeth of the pappus longer than the width of the achenes.

This has been confused with *T. ambiguum*, but is of a quite different habit. *T. intermedium* is much branched and very leafy throughout, has a vertical tap-root of short duration, numerous heads, rather long outer bracts and the inner with narrow scarious margins. *T. ambiguum* is leafy only at the base, has a creeping rootstock, very short outer bracts and the inner with a very broad scarious margin.

T. intermedium grows in sandy or loose soil, often taking possession of old fields and acts much like a weed. The following specimens are at hand.

NEBRASKA: Banner County, 1890, *Rydberg, 192* (type); Crawford, 1889, *H. J. Webber.*

WYOMING: Pine Bluffs, 1897, *Aven Nelson, 3503.*

COLORADO: 1862, *Hall & Harbour, 280,* at least in part.

COLORADO or WYOMING: 1843, *Fremont.*

NEW MEXICO: Between Santa Fe and Canoncito, 1897, *A. A. & E. Gertrude Heller, 3747.*

4. THELESPERMA AMBIGUUM A. Gray, Proc. Am. Acad. **19**: 16. 1883

This species seems to be confined to the plains of western Texas, New Mexico and southern Colorado. The specimens reported from Nebraska and Wyoming belong mostly to the preceding, and those from Montana to *T. marginatum.* The latter resembles *T. ambiguum* in many respects, especially as to the involucral bracts; but it is always without ray-flowers.

5. THELESPERMA SUBNUDUM A. Gray, Proc. Am. Acad. **10**: 72. 1874

This is an inhabitant of the more arid regions of New Mexico, Arizona, Utah and Colorado.

6. THELESPERMA MARGINATUM Rydb. Mem. N. Y. Bot. Garden, **1**: 421. 1900

This grows on dry plains of Alberta and Montana.

7. THELESPERMA GRACILE (Torr.) A. Gray, Kew Journ. Bot. **1**: 253. 1849

Bidens gracilis Torr. Ann. Lyc. N. Y. **2**: 215. 1827.

This species is the most common and most widely distributed species of the genus. It is common on dry plains from Nebraska to Montana, Arizona, Mexico and Texas.

HYMENOPAPPUS L'Her.

Throat of the corolla 1–1.5 mm. long, not over twice as long as the lobes.
Pappus over 1 mm. long, equaling the corolla-tube or nearly so.
Stem 3–6 dm. high, leafy throughout; heads numerous.

Plant sparingly and loosely floccose; leaves glabrate in age.
1. *H. tenuifolius.*
Plant densely tomentose; leaves permanently tomentose.
2. *H. tomentosus.*
Stem less than 3 dm. high.
Stem-leaves much reduced; stem white-tomentose or nearly so; heads few.
3. *H. scaposus.*
Stem-leaves not much reduced; stem sparingly grayish tomentose.
5. *H. cinereus.*
Pappus 1 mm. or less long, shorter than the corolla-tube; stem-leaves and heads few.
Pappus not hidden by the hairs of the achenes.
Stem permanently densely white-tomentose; achenes silky.
4. *H. arenosus.*
Stem sparingly grayish tomentose, glabrate in age; achenes loosely villous
5. *H. cinereus.*
Pappus hidden by the hairs of the achenes, or sometimes none.
Leaflets glabrate in age, at least above; ultimate segment 5–30 mm. long.
6. *H. filifolius.*
Leaves permanently densely white-tomentose; ultimate segments short, 1–5 mm. long.
7. *H. luteus.*
Throat of the corolla 3–4 mm. long, 3–4 times as long as the lobes. 8. *H. macroglottis.*

1. HYMENOPAPPUS TENUIFOLIUS Pursh, Fl. Am. Sept. 742. 1814

This is generally described as a biennial; occasionally the root is of a longer duration and the plant becomes a short-lived perennial and then hard to distinguish from a large specimen of *H. filifolius* except by the pappus. *H. tenuifolius* grows on prairies, from Nebraska and Wyoming to Texas.

2. **Hymenopappus tomentosus** sp. nov.

A densely and permanently white-tomentose plant, apparently biennial. Stem 3–4 dm. high, leafy and branched above: leaves 5–7 cm. long, bi-pinnately divided into linear segments, 4–10 mm. long, about 1 mm. wide: heads many, corymbose-paniculate, about 8 mm. high and broad; involucre densely woolly, somewhat turbinate: flowers yellow: corolla tube and throat each a little over 1 mm. long; the latter broadly campanulate, of about the same length as the lobes; achenes silky strigose; scales of the pappus a little shorter than the corolla-tube.

Nearest related to the preceding, this species is easily distinguished by the dense permanent tomentum and the yellow flowers.

UTAH: St. George, 1877, *Dr. E. Palmer, 270* (type in the Columbia Herbarium).

3. **Hymenopappus scaposus** sp. nov.

Hymenopappus luteus A. Gray, Pl. Fendl. 97. 1849. Not Nutt. 1841.

An almost scapose perennial with a cespitose caudex. Stem almost naked, with 1–2 reduced leaves, more or less densely tomentose: leaves mostly basal, 5–7 cm. long, bipinnately divided into linear segments, 3–10 mm. long, more or less densely tomentose, especially at the base: heads few, corymbose, hemispherical, about 1 cm. high and broad: bracts obovate with yellowish or purplish scarious margins: corollas yellow; tube and throat each nearly 2 mm. long; the latter campanulate and longer than the lobes: achenes densely silky, scales of the pappus fully 2 mm. long, longer than the tube of the corolla.

This species has been confused with *H. luteus* Nutt. but is easily distinguished by the long pappus and also by the longer segments of the leaves. *H. scaposus* grows in dry soil up to an altitude of 2200 m. from New Mexico and Arizona to Utah and Nevada.

ARIZONA: Vicinity of Flagstaff, 1898, *D. T. MacDougal, 129* (type).

NEW MEXICO: Santa Fee, 1897, *A. A. & E. Gertrude Heller, 3555;* 1847, *A. Fendler, 456;* 1869, *E. Palmer, 11.*

UTAH: Southern Utah, 1874, *C. C. Parry, 107.*

NEVADA: 1868, *S. Watson, 612.*

4. HYMENOPAPPUS ARENOSUS Heller, Bull. Torr. Club, **25**: 200. 1898

This resembles somewhat the preceding, but is taller, more leafy, and has much shorter pappus. It grows in sandy soil, up to an altitude of 2200 m., in New Mexico and southern Colorado.

5. **Hymenopappus cinereus** sp. nov.

A grayish tomentose perennial with a cespitose caudex. Stems about 2 dm. high, branched, with 2–4 leaves: these bi-pinnately divided into linear segments 1–2 cm. long and about 1 mm. wide, sparingly grayish tomentulose: heads corymbose, 8–10 mm. high, 10–12 mm. broad, hemispherical or somewhat turbinate: bracts oblong-obovate, with narrow scarious margins: corollas yellow: tube and throat each about 1.5 mm. long; the latter broadly campanulate, longer than the lobes: achenes loosely villous; scales of the pappus variable, in the type fully 1 mm. long and nearly equal-

ing the corolla-tube, but often shorter, yet never hidden by the hairs of the achenes.

This species has been confused with *H. filifolius* and *H. flavescens*. Baker, Earle & Tracy's specimens were determined as the latter by Professor Greene. The species is, however, much nearer related to *H. filifolius*, from which it differs mainly in the lower habit and the longer scales of the pappus. These characters, together with the longer lobes of the leaves distinguish it from *H. luteus*. It grows on dry hills, at an altitude of 1500–3000 m.

COLORADO: Walsenburg, 1900, *Rydberg & Vreeland, 5479* (type); Mesas near Pueblo, *5477*; Cuchara Valley, *5478*; Durango, 1898, *Baker, Earle & Tracy, 1028*; Garden of the Gods, near Pikes Peak, 1895, *E. A. Bessey*.

6. HYMENOPAPPUS FILIFOLIUS Hook. Fl. Bor. Am. **1**: 317. 1833

This species is common on plains and prairies to an altitude of 2000 m., and ranges from Saskatchewan and Montana to Colorado and Nebraska.

7. HYMENOPAPPUS LUTEUS Nutt. Trans. Am. Phil. Soc. (II.) **7**: 374. 1841

Dr. Gray in his Synoptical Flora referred this species to *H. filifolius*, which, however, does not fit Nuttall's description. Many years before he had named Fendler's specimens *H. luteus*. These agree fairly well with Nuttall's description, except as to the pappus, which in them is much more prominent than in any of the other species. Nuttall states that the scales of the pappus of *H. luteus* are very short and hidden by the hairs of the achenes.

In 1897 Prof. Aven Nelson collected a *Hymenopappus* on Green River, which he intended to describe as new, especially as the type specimen was without pappus. A closer examination revealed, however, that some of the specimens really had some small scales. These agreed perfectly with Nuttall's description. Nelson's specimens and my own, collected two years before, also on Green River, are the only ones that perfectly agree with Nuttall's description of *H. luteus*. His type was collected on the Ham's Fork of the Colorado of the West. What the present name of Ham's Fork is or its exact location I have been unable

to find; but from the route that Nuttall took it is undoubtedly some stream of the Green River system.

8. **Hymenopappus macroglottis** sp. nov.

Slightly tomentose perennial with a woody caudex. Stems several, 3–4 dm. high, striate, slightly floccose when young, with 1–3 leaves: leaves mostly basal, about 1 dm. long, bi-pinnately divided into linear lobes 8–25 mm. long, 1–2 mm. wide; stem-leaves generally simply pinnate or the uppermost simple: heads few, corymbose, 12 mm. high and 12–15 mm. broad, hemispherical: bracts oblong, with very narrow yellowish scarious margins: corolla yellow; tube about 2 mm. long; throat deeply campanulate, 3–4 mm. long, 3–4 times as long as the lobes: achenes elongated obpyramidal, about 5 mm. long, hirsute: scales of the pappus about 1 mm. long.

The long and broad lobes of the leaves and the long throat of the corolla distinguishes it from other species of the Rocky Mountains. The latter character it has common with only *H. lugens* Greene from southern California. This has, however, much more finely dissected leaves. *H. macroglottis* grows in arid regions from Texas to Arizona and north to Colorado or Utah.

ARIZONA: Oak Creek, 1883, *H. H. Rusby* (type).

NEW MEXICO: 1851–52, *Wright, 1252.*

TEXAS: Camp 42, 1853, *Bigelow, 730.*

COLORADO or UTAH: 1843, *Fremont.*

A List of the Pteridophyta collected in Alaska in 1900 by Mr. J. B. Flett, with description of a new Dryopteris*

By William R. Maxon

A short time ago Mr. J. B. Flett kindly placed in my hands for determination a set of his collection of ferns and fern allies made in Alaska, largely in the vicinity of Cape Nome, during the summer of 1900. These specimens, which have been deposited in the National Herbarium, have proven of considerable interest, especially since they come in part from a region so little explored botanically. One species is apparently undescribed; the others it seems desirable to catalogue for the record of their occurrence. The notes upon habitat have been furnished by Mr. Flett.

OPHIOGLOSSACEAE

Botrychium boreale (Fries) Milde.

No. 1705. Unalaska; June 19. Rather immature.

POLYPODIACEAE

Polypodium vulgare occidentale Hook.

No. 1510. Dutch Harbor, Unalaska. Growing abundantly among heather on level ground near the shore; June 15. Very abundant all about the island.

This specimen represents a form abundantly collected in Alaska, but less common along the lower coast, with nearly entire and blunter pinnae, for the most part, but otherwise similar to what passes as the variety *occidentale* of Hooker.

Cryptogramma acrostichoides R. Br.

No. 1504. Rocky ledges, vicinity of Nome City; July 21. Not common.

Athyrium cyclosorum Rupr.

No. 1512. Dutch Harbor, Unalaska, June 12.

Phegopteris Phegopteris (L.) Underw.

No. 1502. Sixteen miles west of Nome City; in the shade of alders and willows at the base of the mountain, and among grasses

* Published by permission of the Secretary of the Smithsonian Institution.

near the summit, without shade. Also no. 1519. Unalaska, June 18; not common.

PHEGOPTERIS DRYOPTERIS (L.) Hoffm.

No. 1503. Among grass in crevices of rocky ledges; vicinity of Nome City, August 7.

DRYOPTERIS FRAGRANS (L.) Schott.

No. 1501. In the crevices of loose rocks at the base of a mountain 16 miles west of Nome City, August 20. It was found in its best development at the base of the mountain, but smaller forms occurred at the summit, alt. 800 feet; not abundant, being found in only the one locality.

Dryopteris aquilonaris sp. nov.

Rhizome stout, erect, chaffy with bright-brown concolorous scales; stipes 4–7 cm. long, clustered, sparsely scaly; laminae 5–8 cm. long, narrowly linear-lanceolate, with a few mostly lanceolate scales; pinnae about ten pairs, sub-opposite or alternate, 10–15 mm. long, glandular beneath; oblong-ovate, becoming triangular-oblong below; pinnulae about four pairs to the pinna, obliquely pinnatifid, the divisions with decurrent base, toothed; sori few, 2 or 3 to the pinnula; indusium broadly reniform, ragged.

Type in U. S. National Museum, collected by J. B. Flett, on the summit of a mountain sixteen miles west of Nome City, Alaska, August 7, 1900; no. 1509, altitude 700 feet.

This apparently rare species is most nearly related to *Dryopteris fragrans*, which is common in the same region. However, there seem to be many well-marked differences distinguishing it from that species. The plant is much less rigid, the lower pinnae are not reduced gradually, the pinnae have decidedly fewer pinnules, and the pinnulae are much more dissected. There is noticed also an absence of the dense scaly covering below so characteristic of *D. fragrans*, and a much smaller number of sori. The indusia, too, are rather broader, more irregular, lack the narrow sinus of *fragrans*, and apparently are not glandular at the margin. I have seen no other material referable to the species here described. It was not collected in quantity by Mr. Flett, who found, I believe, only two plants. It is proposed to publish a figure of this species at another time.

DRYOPTERIS SPINULOSA DILATATA (Hoffm.) Underw.

No. 1506. Vicinity of Nome City, ranging from the base of the mountain to the summit, but reaching its best development in the shade at the base; July 20. Also, no. 1511; Dutch Harbor, Unalaska, July 12; in open places.

POLYSTICHUM LONCHITIS (L.) Roth.

No. 1523. Mountains, Unalaska, June 19.

FILIX FRAGILIS (L.) Underw. (*Cystopteris*)

No. 1508. Common in crevices of rocks in the mountains, vicinity of Nome City, July 8 and July 28. Also, no. 1717; common on rocky ledges, Dutch Harbor, Unalaska, June 15.

FILIX MONTANA (Lam.) Underw. (*Cystopteris*)

No. 1507. Growing only in one station, among willows at the base of Anvil Mountain, four or five miles north of Nome City; abundant here within a restricted space; July 8 and August 16.

This species was first recorded from North America upon specimens collected by Drummond in the Rocky Mountains, Lat. 52°–56°. It has since been found in Labrador (*Butler*); on Mt. Albert, Quebec (*Macoun*); near the Current River, north of Lake Superior (*Macoun*); at Kicking Horse Pass, Rocky Mountains (*Macoun*); and near Lake Mistissini, Northeast Territory (*J. M. Macoun*).*

WOODSIA ILVENSIS (L.) R. Br.

No. 1505. Vicinity of Nome City, July 21, August 1 and August 7. Fairly abundant on rocky ledges, but curiously restricted to a belt between 600 and 700 feet in altitude.

WOODSIA GLABELLA R. Br.

No. 1500. Thriving in dry soil in the shelter of minute terraces on the side of Anvil Mountain, four or five miles north of Nome City; widely distributed from base to summit, but nowhere abundant; July 8 and August 16.

The range of this species, originally described from specimens

* See Hooker, Fl. Bor. Am. 2: 260, and Macoun, Cat. Can. Pl., Part V., p. 280, 1890.

collected at Great Bear Lake, is now known to extend from central New York and Vermont to New Brunswick, westward in Canada to the Rocky Mountains, northward to Alaska and the Arctic coast from the Mackenzie River to Baffin Bay. It is apparently rather uncommon in Europe, but has a wide range, occurring in Siberia. The National Herbarium contains specimens also from Arakamtchetchene Island, Bering Straits.

EQUISETACEAE

EQUISETUM ARVENSE L.

No. 1520. Common in the vicinity of Nome City, June 18. This is forma *boreale* (Bong.).

EQUISETUM SYLVATICUM L.

No. 1524. In moist shady places among alders along the border of the tundra, at a point 16 miles west of Nome City; August 5.

EQUISETUM VARIEGATUM Schleich.

No. 1521. Swamps, Unalaska, June 18.

LYCOPODIACEAE

LYCOPODIUM SELAGO L.

No. 1513. Common on hills, Dutch Harbor, Unalaska, June 13. No. 1527; in shady places near the tundra at Nome City, July 22. No. 1526; on the tundra, Nome City, July 22.

These plants represent a considerable diversity with respect to habit and size, but are undoubtedly referable to the single species.

LYCOPODIUM ANNOTINUM L.

No. 1518. On the hills, Unalaska, June 19. No. 1528; in shady places, vicinity of Nome City, July 22. Both numbers represent the form usually known as var. *pungens* Spring.

LYCOPODIUM CLAVATUM L.

No. 1522. Dutch Harbor, Unalaska; June 17; common.

LYCOPODIUM SITCHENSE Rupr.

No. 1514. Common on the hills enclosing the harbor, Unalaska, June 13. No. 1516; Unalaska, alt. 1–2000 ft., June 17.

LYCOPODIUM ALPINUM L.

No. 1515. Unalaska, June 17. No. 1525; in moist shady places, vicinity of Nome City, July 22.

SELAGINELLACEAE

SELAGINELLA RUPESTRIS (L.) Spring.

No. 1529. Common in dry rocky places on mountain summits near Nome City, July 15.

Professor Underwood, who has kindly determined this as the forma *Sibirica* of Milde (Fil. Eu. et Atl. 262), suggests that it probably represents a distinct species.

U. S. NATIONAL MUSEUM, WASHINGTON, D. C.

Beiträge zur Flechten-Flora Süd-Californiens

Von Dr. A. Zahlbruckner

Von Herrn Dr. H. E. Hasse in Soldiers Home (Los Angeles Co.) dem eifrigen und erfolgreichen Sammler und Beobachter der Lichenen Süd-Californiens erhielt ich eine kleine aber interessante Flechtencollection zur Bearbeitung. Bevor ich zur Aufzählung der mitgetheilten Arten schreite, möchte ich auf ein aus dem Studium der Collection sich ergebendes Resultat in kürze hinweisen, das mir in pflanzengeographischer Beziehung bemerkenswerth erscheint. Die Thatsache, dass die mir übersendete Aufsammlung nicht weniger als zwei Arten der Gattung *Dirina* enthielt, ist für die Verbreitung der Flechten in Nord-Amerika von grossem Interesse. Vertreter dieser Gattung wurden bisher in Nord-Amerika nicht aufgefunden; nider Tuckerman * noch Schneider † führen sie an und auch in den der letzten Zeit entstammenden Listen nordamerikanischer Flechten von Fink, Hasse, Nylander, Stizenberger, Willey, und Williams findet sich keine Erwänung. Dieses so späte erfolgte Auffinden in Dirinen in Californien ist bemerkenswerth in Bezug auf die Thatsache, dass daselbst bisher nicht weniger als sechs Arten des Flechtentribus der *Roccellei* festgestellt werden.‡ Nach der bisherigen Beobachtungen bewohnen die *Roccellei* und *Dirina*, die auch phylogenetisch enge verwandtschaftliche Beziehungen aufweisen, dieselbe Gebiete. Ihre Fundorte sind die Meeresküsten und die unmittelbar daran angrenzenden Landestheile. Darbishire ‡ kommt zu dem Schluss, dass die Roccellen das maritime Klima bevorzugen; dasselbe möchte ich auch von *Dirina* behaupten, von letzten sogar sagen, dass ihr Vorkommen geradezu an ein maritimes Klima gebunden sei. Die Angaben in der Lokalflora und auch die Funde Hasse's sind geeignet, meine Anschauung zu bestätigen. Es scheint ferner, dass die Sclerolichenen an den Meeresküsten in einem grösseren Gattungsreichthume auftreten, als in Binnenlande.

* Tuckerman: Synopsis of the North American Lichens (Boston, 1882–1884).

† Schneider: A Text-book of General Lichenology (Binghamton, 1897).

‡ Darbishire, O. V.: Monographie Roccelleorum (Stuttgart, 1898, 40).

Von den beiden in Süd-Californien von Hasse aufgefundenen Arten der Gattung *Dirina* konnte nur die eine mit Sicherheit festgestellt werden, es ist dies eine gut charakteristische neue Art, welche ich zu Ehren des Entdeckers *Dirina Hassei* benannte. Ueber die zweite Art hingegen bin ich derzeit noch nicht in der Lage mir ein definitives Urtheil zu bilden. Äusserlich erinnert sie sehr an *Dirina Ceratoniae* De Notaris und stimmt mit derselben auch in den chemischen Merkmalen des Lagers (KHO flav., $CaCl_2$ erythrin.) überein, doch konnte ich in der scheinbar ihre vollkommene Grösse erreicht habenden Apothecien keine Schläuche mit ausgebildeten Sporen auffinden, mir daher über die Gestalt desselben keine Sicherheit verschaffen. Ohne Kenntniss der Sporen wurde ich aber eine Identification der californische Flechten mit *Dirina Ceratoniae* De Notaris, die bisher nur in den Ländern der Mittelmeeres beobachtet wurde, für ungerechtfertigt betrachten.

In der folgenden Zeilen beschreibe ich fünf Arten und eine Varietät als neu. Daran dass sich in der Collection Hasse's einige neue Flechtentypen finden werden, konnte von vornherein nicht gezweifelt werden. Dann wenngleich für Süd-Californien, wie dies aus Hasse's Zusammenstellung* hervorgeht, in der letzten Zeit eine Reihe von Neuheiten erkannt wurden so ist der Reichthum an solchen in einem klimatologisch und pflanzengeographisch eigenartigen Gebiete gewiss noch lange nicht erschöpft.

STENOCYBE ATREMULICOLA Norrl.; Nyl. Flora, 531. 1883. Hue, Addend. Lichenogr. Europ. 23. 1886.

Ad corticem Sambuci glaucae in montibus Santa Monica (no. 695).

LECANORA CENISEA Ach., Lictgr. Univ. 361. 1810.

Lecanora subfusca var. *cenisea* Th. Fries, Lictgr. Scand. **1**: 240. 1870.

Lecanora atrynea β cenisea Nyl.; Lamy Bull. Soc. Bot. France, **25**: 409. 1878.,

Ad saxa granitica in montibus San Bernardino, circa 1300, mt. j. m. no. 707.

---

* Hasse, H. E.: Lichens of Southern California. Second Edition (Los Angeles, 1898, 89).

Lecidea (Biatora) xanthococcoides sp. nov.

Thallus tenuis, ruguloso-granulatus vel verrucosus, pallide cervino-fuscescens; KHO —, $CaCl_2$ —, non corticatus, hyphis non amyloideis. Gonidia protococcoidea, globosa, 10–18 μ diam. Apothecia parva (0.2–0.3 mm. lata), sessilis, nigra, opaca, primum modice concava vel plana, margine tenui, integro subnitidoque cincta, demum convexa et immarginata. Excipulum et hypothecium fuscum. Hypothecium obscure fuscum, NO_5 —, KHO nubes fuscescentes effundens. Hymenium 160–180 μ altum. I coerulescens, dein obscure fulvescens. Paraphyses conglutenatae, tenues. Asci oblongo- vel ovoideo-cuneati, 8-spori. Sporae ovales vel oblongo-ovales, obtusae, simplices, hyalinae, 12–15 μ longae et 5.5–6 μ latae, episporio tenui.

Habita ad *Lecideam xanthococcam* accedit, sed structura interna apotheciorum ab ea longe distat. *Lecideae hypomelaenae* Nyl. affinis.

Ad truncos Coniferarum in montibus San Bernardino, circa 1700 mt. s. m. (no. 705).

Lecidea cinerata sp. nov.

Thallus exceptis partibus sub apotheciis sitis non evolutus; medulla cretacea, albida, KHO —, I —. Apothecia conferte, parva (0.5–1 mm. lata), anguloso-rotundata, sinuosa vel sinuoso-lobata, primum dense cinereo-pruinosa, urceolata, demum disco plano et minus pruinoso, margina crasso persistente, obtuso, cinereo-pruinoso cincta. Epithecii pars marginalis coeruleo-nigricans, pars interna lutescens. Hypothecium crassum, fulvescens. Hymenium I coerulescens, dein fulvescenti-obscuratum. Paraphyses tenues, eseptatae, conglutenatae, apice olivaceo-nigricantes. Asci oblongo-cuneati, 8-spori. Sporae hyalinae, simplices, 12–14 μ longae et 5–6 μ latae, episporii tenui. Pycnoconidia non visa.

E stirpe *Lecideae lithophilae* Ach.

Ad saxa granitica in montibus Santa Monica, circa 270 mt. s. m. (no. 714).

BUELLIA (CATOLECHIA) BADIA Koerb., Syst. Lich. Germ. 226. 1855; Th. Fries, Lichgr. Scand. 1: 588. 1874.—*Lecidea badis* E. Fries, Syst. Orb. Veg. 287. 1825.

Ad saxa in montibus San Gabriel (no. 701).

Dirina Hassei sp. nov.

Thallus effusus, continuus, ramulus lata obtegens, tenuis, ruguloso-rimosus, areolas parvas formans, rarius rugulosus lutescenti-

albidus, opacus, KHO leviter flavescens, $CaCl_2$ et KHO + $CaCl_2$ —, in margine linea obscuriore non cinctus. Apothecia parva, 0.3–0.7 mm. lata, rotunda vel subrotunda, copiosa, dispersa, sessilia primum plana et dense caesio-pruinosa, demum parum convexa, minus pruinosa vel nigricantia, margine thallino albido, integro et persistente cincta. Hypothecium fusconigrum, sat crassum. Hymenium I vinose rubens. Asci subcylindrico-saccati vel saccati et subcuneati, 8-spori, 47–54 μ longi et 8–9 μ lati. Paraphyses filiformes, apice subclavatim incrassatae et fuscae. Sporae leviter curvulae, fusiformes, apicibus obtusis, hyalinae, 3-septatae, 15–20 μ longae et 3–4 μ latae, episporio tenui. Receptacula pycnoconidiorum minutissime, thallo immersa et solum vertice nigro nitidoque prominentia, sterigmatibus versus basin ramosis, brevibus (13–16 μ longis); pycnoconidiis minutis, oblongis, apicibus obtusis, leviter curvulis, 3–4 μ longis et 0.6–0.8 μ latis.

Species thallo tenui, $CaCl_2$ non reagente, apotheciis parvis et tenuiter marginatis, sporis et pycnoconidiis leviter curvulis distincta. A sat simili *Platygrapha Californica* Tuck. (= *Dirina Californica* Tuck. in litt.) jan. apotheciis rotundis et thallino-marginatis longe distat.

In cortice ramulorum *Rhoidis laurinae* ad ora maris prope Santa Monica (no. 671).

OPEGRAPHA VARIA var. LICHENOIDES (Pers.) f. CHLORINA (Jatta Exsicc. 53).

Disco virescenti-pruinoso.

Ad corticem Umbellulariae Californicae (no. 693).

Platygrapha hypothallina sp. nov.

Hypothallus bene evolutus, dendriticus vel connexo-ramosus, albus, laxe contextus. Thallus sat tenuis, plicato-rugulosus, opacus, pallide isabellinus, mollis, laxe cortextus, in hypothallo plagas formans dispersas vel subconfluentes, KHO—, $CaCl_2$ erythinosus. Apothecia solitaria, sessilia, subrotundata, oblonga vel gyrosa, rarius substellata, convexa, albo-farinosa (detrita nigra), usque 1.5 mm. longa et 0.3–0.5 mm. lata, margine proprio nullo, sed thallo in margine accessore cincta et etiam in disco lateraliter hyphis thallinis, demum evanescentibus tecta. Hypothecium crassum, nigrofuscum, KHO—. Hymenium 86–90 μ altum. I. vinose rubens. Epithecium obscure fuligineum, KHO et NO_5—. Paraphyses tenues, ramoso-convexae. Asci saccato- vel subcylindrico-cuneati, apice obtusi at pachydermi, 62–74 μ alti et 12–15 μ lati, 6–8-spori. Pycnoconidia non visa.

Ad saxa schistosa in Catalina Island (no. 692). Legit Blanche Trask.

A corticola *Platygrapha Californica* (Tuck.) differt hypothallo evolutio et apotheciis aliis.

Chiodecton ochroleucum sp. nov.

Thallus tenuis, effusus, inaequalis vel subrugulosus, tartareus, ochroleucus, KHO flavens, $CaCl_2$ erythrinosus, medulla alba, I vinosa fulvescenti. Gonidia chroolepoidea, cellulis ellipsoideis vel oblongis, concatenatis. Pocadostromata thallo immersa vel rarius demum modica prominale, irregulariter oblonga, usque 1 mm. vel parum ultra longa, niveo-pruinosa. Hymenia stellata, substellata, elongata, vel plus minus flexuosa, apicibus obtusis, humectata mollia et turgescentia, ochracea, margine disphana, intus pallida, I vinosa-rubescentia. Hypothecium et epithecium pallidum (lutescens). Paraphyses tenuies, filiformes, connexo-ramosae. Asci ovali-cuneati, 8-spori, 53–62 μ longi et 20–22 μ lati. Sporae ovales vel ovali-oblongae, hyalinae, transversim 4–5-septatae, cellulis cylindricis, 14–18 μ longi et 8 μ latae, episporio tenui. Receptacula pycnoconidiorum punctiformia, nigra, nitida, immersa, excepto vertice; sterigmatibus basi ramosis, cellulis superioribus subinflatis, longioribus, subfasciculatis; pycnoconidiis filiformibus, arcuatis, 11–18 μ in diam. et 1.5–1.8 μ latis.

Species distincta, a *Chiodectone Californica* Tuck. hymenio pallido et sporis minoribus latissibusque distat.

Ad corticem *Rhoidis integrifoliae* in Catalina Island. Legit Blanche Trask, no. 694.

ARTHONIA PATELLULATA **caesiocarpa** var. nov.

Thallus tenuis, albens, determinatus. Apothecia caesio-pruinosa, in margine tamen plerumque nuda et nigra. Hypothecium pallidum. Epithecium coerulescenti-fuligineum. Sporae 15–17 μ longae et 5.5–6 μ latae.

In ramulis *Malvastri Thurberi* in montibus Santae Monicae (no. 690 pr. p.).

Arthothelium pruinascens sp. nov.

Thallus epiphloeodes, tenuis, determinatus, subrugulosus, cinereus vel flavido-cinereus, opacus, KHO —, $CaCl_2$ —, hypothallo indistincto. Apothecia innata, parva, rotundato-angulata vel fere oblonga, 0.2–0.3 mm. lata, plana, nigra, et caesio-pruinosa, humectata turgescentia et nigra. Hymenium pallida fulvescens, I ascis

vinosis. Epithecium fuscescenti-nigricans, non granulosus Paraphyses indistinctae. Asci copiosi, pyriformes, 70–74 μ longi et 31–40 μ lati, 8-spori. Sporae ellipsoideae, hyalinae, murali-divisae, septis transversalibus 6–7 et septis longitudinalibus plerumque 4, 16–22 μ longae et 9–13 μ latae. Pycnoconidia non visa.

E grege *Arthothelii spectabilis* Sw. apothecibus innatis, pruinosis et sporis minutis insignis species.

In ramulis *Malvastri Thurberi* in montibus Sanctae Monicae (no. 696 pr. p.).

Bryological Notes.—I

By Elizabeth G. Britton

Didymodon riparius Aust.—This species was described as *Pottia riparia* Aust. in the Supplement to Sullivant's Icones in 1874, and the fruit was figured on Plate 21. In 1880, Warnstorf described *Barbula lingulata*, which Limpricht later changed to *Trichostomum Warnstorfii* (Laubm. 1: 587. 1888) the specific name being preoccupied. In 1892, Kindberg in Macoun's Catalogue, described *Leptodontium Canadense*, as a new species, remarking that "it is rather peculiar that this genus had not been represented before in North America." In the Bryineae of Europe and North America, he redescribed this species as *Didymodon Macounii* Kindb. (new name) and referred *Pottia riparia* Aust. to *Didymodon riparius* Aust., the name it bore in Austin's herbarium. I have critically compared all these specimens and am persuaded that they are one and the same species, characterized by very peculiar brood-bodies, borne on long slender filaments, either in clusters in the axils of the leaves or at the summit of the stems, mixed with the archegonia and seeming to replace the paraphyses. Limpricht figured them on page 588, Fig. 171 of the Laubmoose, and Correns in his Untersuchen der Laubmoose has also figured and described them as *Trichostomum Warnstorfii*. The European specimens have not been found fruiting, and Austin's station on the Palisades is the only one thus far discovered where it is known to fruit. It has probably been overlooked in many places, on account of its small size, dirty appearance and sterility. The following stations are recorded for North America: On rocks in streams, Palisades of northern New Jersey and southern New York, C. F. Austin; Niagara Falls, F. Wolle; Watkins; Chilson Lake; Mrs. Harris, Bashbish Falls, R. S. Williams. Penna.: Bethlehem, Rau and Wolle; Pocono Mt., T. C. Porter; Springfield, Ohio, Miss Biddlecome; Owen Sound, Ont., J. Macoun. In Europe it is only known in Switzerland from the Rhine at Schaffhausen and in the lake at Zurich.

Grimmia anomala Hpe.—In a recent number of the Revue Bryologique, Mr. Ernest S. Salmon has described and figured the difference between *Grimmia anomala* and *G. Hartmanni*, two very rare European mosses, of which *G. anomala*, was not known to fruit, and *G. Hartmanni* had only been found once fruiting in Corsica. Both bear propagating gemmules on the leaves, the points of which are abnormally differentiated for their production. The sterile plants may be distinguished by cross-sections of the stem, that of *G. Hartmanni* having a central strand, *G. anomala* being without.

In 1891, I described *Grimmia Philibertiana*, from specimens collected by J. B. Leiberg, in Idaho, and figured it on Plate 114 of the Bulletin of the Torrey Botanical Club. From recent exchanges of specimens, I have discovered that *G. Philibertiana* is the same as the European *G. anomala*, and Mr. Salmon agrees with me. This is the second species of *Grimmia* which Mr. Leiberg has found fruiting, of which the fruit was unknown in Europe.

G. anomala has been found fruiting at Seljestad in Norway, July, 1900, by H. N. Nixon and Nicholson and *G. torquata* was collected in fruit in 1892 at Gausdal, Norway, by E. Ryan.

Typhula muscicola (Pers.) Fries. This species of fungus is usually found growing in wet shady places on mosses and other plants near them. It has been collected on the following species: *Climacium Americanum* Brid., Farmingham, N. Y., Edgar Brown; var. *fluitans* Aust. Garrisons, N. Y., A. J. Grout; *C. dendroides* (L.) Web. & Mohr, Vermilion Lake, E. W. D. Holway; *Entodon seductrix* (Hedw.) CM. H. W. Ravenel, S. C. (Fungi Car. Exsicc. no. 36); *Leskea obscura* Hedw., Emma, Mo., C. H. Demetrio (E. & E. N. Am. Fungi no. 2320); *Plagiothecium striatellum* Lindb. Ringwood, N. J., N. L. Britton; *Pylaisea velutina* Sch., Wilmington, Del., A. Commons; *Thuidium minutulum* (Hedw.) Br. & Sch., S. C. Ravenel, no. 36; *T. recognitum* (Hedw.) Lindb. E. A. Rau. The small capitate sclerotium has been collected by Edgar Brown; when sterile the fungus looks like a slender white *Clavaria* from 2–9 mm. high.

Proceedings of the Club

WEDNESDAY EVENING, OCTOBER 31, 1900

The meeting was held at 4 P. M. in the Conference Room of the Museum of the Botanical Garden at Bronx Park.

Professor Underwood presided in the absence of other officers. Seventeen persons were present.

The following new members were elected: Miss Gail H. Pierce, 128 Lincoln Ave., Newark, N. J.; Mr. Joseph E. Kirkwood, Teachers College, New York City.

The Secretary made announcement of the death during the summer of one of the members of the Committee on Nominations, Miss Jeannette B. Greene, M.D.

The program consisted of a paper by Dr. P. A. Rydberg, on "The Melanthaceae of the Rocky Mountains." Numerous herbarium specimens were exhibited, including the types of seven new species described by Dr. Rydberg in the BULLETIN for October. To these descriptions he now added further particulars regarding habit, distribution and critical characters, presenting also a series of comparative drawings of their petals and sepals. One of these new species of especial interest is *Veratrum speciosum*, to which most of the specimens previously ascribed in herbaria to *V. Californicum* prove to belong. The presence of conspicuous petioles at the lower leaves of typical *V. Californicum* was demonstrated from the type-specimen and also by explicit accompanying statements by Dr. Asa Gray whose manuscript description was produced.

EDWARD S. BURGESS,
Secretary.

TUESDAY EVENING, NOVEMBER 13, 1900

Professor Underwood presided in the absence of the officers of the Club. Thirteen persons were present.

The recent death of Rev. George D. Hulst, a member of the Club was mentioned by Professor Britton, and the Club voted that the Secretary be requested to send an expression of sympathy to the bereaved family.

The program consisted of an account by Dr. Britton of his recent trip to Paris, where he represented the United States at the International Congress of Botanists. The first day, Monday, October 1st, was given up to organization of the Congress. The next day, a visit was made to the Jardin des Plantes under direction of M. Cornu, and some papers were read. An important one was by Professor Flahault of Montpellier on the relations of herbaria and botanical gardens.

On succeeding days, in addition to reading of papers, visits were made to private herbaria and gardens. Dr. Britton remarked that the so-called *Solidago Virga-aurea* of America differs widely from the plant of Switzerland and Wales, particularly in having a very viscid character.

On Friday, October 5th, there was a continuation of a discussion begun previously in regard to future congresses. It was decided that the next congress should be held in 1905 at Vienna.

Dr. Britton also spoke briefly of the botanical and horticultural exhibits of the Exposition, and of the large amount of museum and horticultural material which he was able to secure.

After leaving Paris, Dr. Britton visited the Swiss Botanical Garden at Zurich, and went to Frankfurt and Wiesbaden. He also spent six days in Berlin, which he describes as the most active botanical center of the world.

From Berlin he went to Kew and South Kensington, where he found considerable changes from the conditions at his last visit, nine years previously.

TRACY E. HAZEN,
Secretary pro tem.

Index to recent Literature relating to American Botany

Andrews, A. L. The Orchidaceae of a Series of Swamps in southern Vermont. Rhodora, **2**: 114, 115. 21 Je. 1900.

Arnoldi, W. Ueber die Ursachen der Knospenlage der Blatter. Flora, **87**: 440–478. *f. 1–45.* 5 O. 1900.

Arthur, J. C. New Station for the dwarf Mistletoe. Rhodora, **2**: 221–223. N. 1900.

Report of the discovery of this species on Isle au Haut, Maine.

Bailey, W. W. *Solidago tenuifolia* as a Weed in Rhode Island. Rhodora, **2**: 226. N. 1900.

Bailey, W. W. The old-time Flora of Providence. Rhodora, **2**: 213–220. N. 1900.

Baranetzky, M. J. Recherches sur les faisceaux bicollatéraux. Ann. Sc. Nat. Bot. VIII. **12**: 261–332. *pl. 7–10.* 1900.

Beadle, C. D. Studies in *Crataegus.*—II. Bot. Gaz. **30**: 335–346. 15 N. 1900.

C. aprica, C. sororia, C. Alleghaniensis, C. venusta, C. Askei, C. senta, C. Alabamensis, C. pinetorum, C. rubella, and *C. straminea* new.

Berry, E. W. Abnormal Forms of Dogwood. Plant World, **3**: 56, 57. *f. 1–3.* Ap. 1900.

Billings, F. H. Ueber stärke corrodirende Pilze und ihre Beziehung zu Amylotrogus Roze. Flora, **87**: 288–298. *pl. 11, 12.* 30 J. 1900.

Bissell, C. H. A new Variety of *Zizia aurea.* Rhodora, **2**: 225. N. 1900.

Zizia aurea obtusifolia.

Bissell, C. H. Abnormal Flowers in *Leonurus Cardiaca.* Rhodora, **2**: 223, 224. N. 1900. [Illust.]

Brandegee, T. S. A new *Tapirira* from Baja California. Zoe, **5**: 78, 79. N. 1900.

Tapirira edulis sp. nov.

Brenner, W. Untersuchungen an einigen Fettpflanzen. Flora, **87**: 387–439. *f. 1–15.* 5 O. 1900.

An experimental investigation of a number of succulents included in *Sedum, Crassula, Sempervivum,* and *Mesembryanthemum.*

Britton, E. G. Note on *Trichostomum Warnstorfii* Limpr. Rev. Bryol. **27**: 71. 1900.

Britton, N. L. Dr. Torrey as a Botanist. Bull. Torr. Club, **27**: 540–551. 26 O. 1900.

Burgess, E. S. The Work of the Torrey Botanical Club. Bull. Torr. Club, **27**: 552–558. 26 O. 1900.

Burns, G. P. Beiträge zur Kenntniss der Stylidaceen. Flora, **87**: 313–354. *pl. 13–14. f. 1–45.* 5 O. 1900.

A morphological and physiological study of the Lobeliaceae, Campanulaceae, Goodeniaceae, Stylidaceae, and Cucurbitaceae.

Byxbee, E. S. The Development of the karyokinetic Spindle in the Pollen-Mother-Cells of *Lavatera*. Proc. Calif. Acad. Sci. (Botany) III. **2**: 63–82. *pl. 10–13.* 31 O. 1900.

Cannon, W. A. The Gall of the Monterey Pine. Am. Nat. **34**: 801–810. *f. 1–6.* O. 1900.

Celakovsky, L. J. Neue Beiträge zum Verständniss der Fruchtschuppe der Conifereen. Jahrb. wiss. Bot. **35**: 407–448. *pl. 10, 11.* 1900.

Chauvead, M. G. Recherches sur le mode de formation des tubes criblés dans la racine des Dicotylédones. Ann. Sc. Nat. Bot. VIII. **12**: 323–394. *pl. 11–14.* 1900.

Chesnut, V. K. A fatal Case of *Amanita* Poisoning. Plant World, **3**: 8. Ja. 1900.

Chesnut, V. K. Poisonous Properties of the green-spored *Lepiota*. Asa Gray Bull. **8**: 87–93. *pl. 5.* O. 1900.

Clute, W. N. The Making of an Herbarium. Fifth Paper. Arranging for Use. Plant World, **3**: 54–56. Ap. 1900.

Cockerell, T. D. A. *Gaurella* = *Gauropsis*. Bot. Gaz. **30**: 351. 15 N. 1900.

Coe, M. A. Autumnal Flowering of *Vaccinium Pennsylvanicum*. Rhodora, **2**: 224, 225. N. 1900.

Collins, F. S. Seaweeds in Winter. Rhodora, **2**: 130–132. 21 Je. 1900.

Conn, H. W. Classification of Dairy Bacteria. Rep. Storrs (Conn.) Agr. Exp. Sta. **12**: 13–68. 1900.

Corbett, L. C. An improved Auxanometer and some of its Uses. Rep. W. Va. Agric. Exp. Sta. **12**:—(1–8). *f. 3–6.* 1900.

Corbett, L. C. Fruit Diseases and how to treat them! Bull. W. Va. Agric. Exp. Sta. 66: 199–235. *f. 1–23.* F. 1900.

Coulter, J. M. Geographical Distribution of Conifers. Plant World, **3**: 20, 21. F. 1900.

Cowell, J. F. David Fisher Day. Bot. Gaz. **30**: 347, 348. *portrait.* 15 N. 1900.

Crandall, C. A. The tall green Orchis (*Habenaria hyperborea*) visited by Mosquitoes. Plant World, **3**: 6, 7. Ja. 1900.

Crawford, J. Notes on *Ophioglossum*. Plant World, **3**: 154, 155. O. 1900.

Crépin, F. Note upon a probable Hybrid of *Rosa Carolina* L. and *Rosa nitida* Willd. Rhodora, **2**: 112, 113. 21 Je. 1900.

Creevey, C. A. Plant Juices and their commercial Values. Plant World, **2**: 161–165. Jl. 1899; 187–189. Au. 1899; 200–204. S. 1899; **3**: 9–12. Ja. 1900; 26–28. F. 1900; 42–44. Mr. 1900; 58–59. Ap. 1900.

Curtiss, A. H. The Water Hyacinth in Florida. Plant World, **3**: 38–40. Mr. 1900.

Curtiss, A. H. Some nameless Plants. Plant World, **3**: 105–107. Jl. 1900.

Czapek, F. Ueber den Nachweis der geotropischen Sensibilität der Wurzelspitze. Jahrb. wiss. Bot. **35**: 313–365. *pl. 8.* 1900.

Davis, K. C. A taxonomic Study of North American Ranunculaceae, 1–8, 13–18, 21–28. 19 My. 1900.

Includes descriptions of our species of *Crossosoma*, *Hydrastis*, *Caltha* (2 species new), *Trollius*, *Cammarum*, *Nigella*, *Isopyrum*, *Coptis Xanthorrhiza*, *Anemonopsis*, *Cimicifuga*, *Actaea*, *Hepatica*, *Syndesmon*, *Myosurus*, *Trautvetteria*, and *Adonis*, including several new varieties.

Davis, K. C. A synonymic Conspectus of the native and garden Thalictrums of North America. Minn. Bot. Stud. **2**: 509–523. 15 Au. 1900.

Davis, K. C. Wild and garden Paeonies in America. Plant World, **3**: 22–25. F. 1900.

One species American.

Davis, K. C. Native and Garden Delphiniums of North America. Minn. Bot. Stud. **2**: 431–457. 15 Au. 1900.

Delphinium Treleasei Bush, new species. *D. bicolor Nelsoni*, *D. bicolor cognatum*, *D. bicolor glareosum*, *D. decorum gracilentum*, *D. hesperium recurvatum*, *D. variegatum Blochmanae*, *D. variegatum Emiliae*, *D. Geyeri Wootoni*, *D. Geyeri geranifolium*, *D. camporum Penardi*, *D. camporum macroseratilis*, *D. scopulorum diversifolium* and *D. Nutallii leucophaeum*, species reduced to varieties.

Davis, K. C. Native and cultivated *Ranunculi* of North America and segregated Genera. Minn. Bot. Stud. **2**: 459–507. 15 Au. 1900.

Ranunculus fascicularis Deforesti and *R. McCallai*, new American species and vari-

eties. *R. Macounii Oreganus, R. subalpinus, R. canus hesperoxys, R. Californicus Ludovicianus, R. Bongardi Douglasii, R. pedatifidus pinetorum, R. Mexicanus, R. pygmaeus Sabinii, R. ambigens obtusiusculus, R. alismaefolius calthaeflorus, R. alismellus Populago* and *R. reptans Gormani*, new names and combinations.

Davis, W. F. Observations on a Woodland Fire. Plant World, **3**: 4–6. Ja. 1900.

Davenport, G. E. *Dicksonia pilosiuscula*, var. *cristata*. Rhodora, **2**: 220, 221. N. 1900.

Devaux, M. H. Recherches sur les lenticelles. Ann. Sc. Nat. Bot. VIII. **12**: 1–240. *pl. 1–6.* 1900.

DeCandolle, C. Piperaceae Uleanae e Brasilia. Engler's Bot. Jahrb. Beiblatt, **29**: 24–27. 4 S. 1900.

Three new species of *Piper* and *Peperomia* described.

Dobbin, F. Naturalized Compositae. Plant World, **3**: 134–136. S. 1900.

Dobbin, F. Native Orchids. Plant World, **3**: 88, 89. Je. 1900.

Dooris-Sharp, K. The Passing of the Wildwood. Plant World, **3**: 72–74. My. 1900.

Driggs, A. W. Notes on the Flora of Hartford, Litchfield and Tolland Counties [Connecticut], pp. 1–4. 1 S. 1900.

Durand, E. J. The Classification of the fleshy Pezizineae with reference to the structural Characters illustrating the Bases of their Division into Families. Bull. Torr. Club. **27**: 463–495. *pl. 27–32.* 29 S. 1900.

Eastwood, A. New Species of California Plants. Zoe, **5**: 80–90. N. 1900.

New species in *Salix, Chrysopsis, Helianthella, Sphacele, Mimulus, Aphyllon, Asclepias, Cleomella, Peucedanum* and *Navarretia.*

Eastwood, A. Rediscovery of *Thermopsis macrophyllum* H. & A. Zoe, **5**: 76–78. N. 1900.

Evans, A. W. Notes on the Hepaticae collected in Alaska. Proc. Wash. Acad. Sci. **2**: 287–314. *pl. 16–18.* 10 O. 1900.

List of 63 species collected by the Harriman expedition with descriptions of several circumboreal species new to America.

Evans, W. H. Notes on the edible Berries of Alaska. Plant World, **3**: 17–19. F. 1900.

Fanning, M. G. Some Algae in ornamental Waters. Plant World, **3**: 49–52. *pl. 1.* Ap. 1900.

Farwell, O. A. Flora of the Park System and throughout the City of Detroit. Ann. Rep. Commissioners of Parks and Boulevards (Detroit, Mich.) **11**: 41–94. 1900.
861 species and varieties enumerated.

Fernald, M. L. Some Jesuit Influences upon our northeastern Flora. Rhodora, **2**: 133–142. 10 Jl. 1900.

Fink, B. Additions to the Bibliography of North American Lichens. Rep. Iowa Acad. Sci. **6**: 165–173. 1899.

Fink, B. Notes concerning Iowa Lichens. Rep. Iowa Acad. Sci. **5**: 174–187. 1898. Also separate pp. 1–14.

Fischer, H. Der Pericykel in den freien Stengelorganen. Jahrb. wiss. Bot. **35**: 1–27. *pl. 1.* 1900.

Fisher, W. L. The Violets on Long Island. Plant World, **3**: 91, 92. Je. 1900.

Fitting, H. Bau und Entwickelungsgeschichte der Makrosporen von *Isoetes* und *Selaginella* und ihre Bedeutung für die Kenntniss des Wachstums pflanzlicher Zellmembranen. Bot. Zeitung, **58**[1]: 107–165. *pl. 5–6.* 16 Au. 1900.

Freeman, E. M. A preliminary List of Minnesota Erysipheae. Minn. Bot. Stud. **2**: 423–430. 15 Au. 1900.
19 species enumerated.

Fritsch, K. Beitrag zur Kenntniss der Gesneriaceen-Flora Brasiliens. Engler's Bot. Jahrb. Beiblatt, **29**: 5–23. 4 S. 1900.
New species in *Hypocyrta*, *Seemannia*, *Vanhouttea* and *Corytholoma*.

Gaucher, L. Du rôle des laticifères. Ann. Sc. Nat. Bot. VIII. **12**: 241–260. *f. 1–8.* 1900.

Geheeb, A. Revision des Mousses récoltées en Brésil dans la province de San Paulo par M. Juan J. Puiggari pendant les années 1877–1882. Rev. Bryol. **27**: 65–71. 1900.

Gifford, J. Silvicultural Prospects of the Island of Cuba. Forester, **6**: 179–183. Au. 1900. [Illust.]

Gottschall, M. Anatomisch sytematische Untersuchung des Blattes der Melastomaceen aus der Tribus Miconieae. Mem. Herb. Boissier, **19**: 1–176. *pl. 1–3.* 25 S. 1900.
211 species studied, all American.

Gould, C. N. Radiate Structure of the wild Gourd (*Cucurbita foetidissima*). Plant World, **3**: 153, 154. O. 1900.

Graebner, P. Die Gattung Linnaea (einschliesslich Abelia). Engler's Bot. Jahrb. **29**: 120–145. 22 My. 1900.
Two species and one variety American.

Grieve, S. Additional Notes on *Andromeda polifolia*. Trans. Bot. Soc. Edinb. **21**: 258–269. 1900.

Grout, A. J. Illustrated Glossary [Musci]. Bryologist, **3**: 2, 3. Ja. 1900; 23, 24. Ap. 1900; 31–33. Jl. 1900; 45–48. O. 1900.

Grout, A. J. *Weissia*. Bryologist, **3**: 43, 44. O. 1900. [Illust.]

Halsted, B. D. Coloration of Leaf for Seed Distribution. Plant World, **3**: 22. F. 1900.

Halsted, B. D. Report of the Botanical Department of the New Jersey Agricultural College Experiment Station. Rep. N. J. Agric. Exp. Sta. **20**: 323–419. *f. 2–16.* 1900.

Harger, E. B. Stations for some of the less usual Plants of Connecticut. Rhodora, **2**: 125–127. 21 Je. 1900.

Harper, R. A. Cell and Nuclear division in *Fuligo varians*. Bot. Gaz. **30**: 217–251. *pl. 14.* 15 O. 1900.

Harper, R. M. Notes on the Flora of South Georgia. Bull. Torr. Club, **27**: 413–436. 6 S. 1900.

Harper, R. M. Notes on the distribution of some of the rarer plants of Central Massachusetts. Rhodora, **2**: 119–123. 21 Je. 1900.

Harshberger, J. W. Philadelphia Botanists commemorated in the Names of Plants. Plant World, **3**: 74–76. My. 1900.

Hastings, G. T. When Increase in Thickness begins in our Trees. Plant World, **3**: 113–116. Au. 1900.

Hefferan, M. A new chromogenic *Micrococcus*. Bot. Gaz. **30**: 261–272. *f. 1–4.* 15 O. 1900.

Hemsley, W. B. *Castilloa Funii* Hemsl. Hook. Icon. Plant IV. **7**: *pl. 2651.* Au. 1900.
A new species from Central America.

Hill, E. J. An Observation on the Water-shield (*Brasenia peltata*). Plant World, **3**: 153. O. 1900.

Hill, E. J. *Celtis pumila* Pursh, with Notes on allied Species. Bull. Torr. Club. **27**: 496–505. *pl. 33. f. 1–4.* 29 S. 1900.

Hill, E. J. *Primula Mistassinica*. Plant World, **3**: 104, 105. Jl. 1900.

Hill, E. J. The Southern Limit of *Juniperus Sabina*. Plant World, **3**: 140. S. 1900.

Hitchcock, A. S. Collecting Sets of Plants for Exchange. Plant World, **3**: 148–151. O. 1900.

Hudson, E. R. A new Species of *Neovossia*. Bot. Gaz. **30**: 273, 274. *f. 1.* 15 O. 1900.

Holm, T. Studies in the Cyperaceae; XIII. *Carex Willdenovii* and its allies. Am. Jour. Sci. IV. **10**: 33–47. *f. 1–3.* Jl. 1900.

Holm, T. Studies in the Cyperaceae; XIV. On a collection of *Carices* from Alaska, with remarks upon the affinities of *Carex circinata* C. A. Mey., and *C. lejocarpa* C. A. Mey. Am. Jour. Sci. IV. **10**: 266–284. *f. A–G.* O. 1900.

Carex cryptantha, *C. lugens* and *C. macrocephala bracteata*, new species and variety.

Holzinger, J. M. A *Polytrichum* new to North America. Asa Gray Bull. **8**: 95–99. *pl. 6.* O. 1900.

Holzinger, J. M. Suggestions for Glycerine Jelly Mounts. Bryologist, **3**: 42. O. 1900.

H[ooker], J. D. *Convolvulus macrostegius.* Curt. Bot. Mag. III. **56**: *pl. 7717.* 1 Je. 1900.

Native of Lower California.

H[ooker], J. D. *Mamillaria vivipara.* Curt. Bot. Mag. III. **56**: *pl. 7718.* 1 Je. 1900.

Native of the Rocky Mountains.

H[ooker], J. D. *Cypripedium guttatum.* Curt. Bot. Mag. III. **56**: *pl. 7746.* N. 1900.

Native of N. E. Europe, Asia, and N. W. America.

H[ooker], J. D. *Erigeron leiomerus.* Curt. Bot. Mag. III. **56**: *pl. 7743.* N. 1900.

Native of the Rocky Mountains.

H[ooker], J. D. *Dipladeni eximia.* Curt. Bot. Mag. III. **56**: *pl. 7720.* Je. 1900.

Native of Brazil.

H[ooker], J. D. *Helenium tenuifolium.* Curt. Bot. Mag. III. **56**: *pl. 7721.* Je. 1900.

Native of the eastern United States.

H[ooker], J. D. *Hesperaloe yuccaefolia.* Curt. Bot. Mag. III. **56**: *pl. 7723.* Jl. 1900.

Native of Texas.

H[ooker], J. D. *Dipladenia pastorum* var. *tenuifolia.* Curt. Bot. Mag. III. **56**: *pl. 7725.* Jl. 1900.

Native of Brazil.

H[ooker], J. D. *Robinia Neo-mexicana.* Curt. Bot. Mag. III. **56**: *pl. 7726.* Jl. 1900.

Native of the Rocky Mountains.

H[ooker], T. D. *Cattleya* × *Whitei*. Curt. Bot. Mag. III. **56**: *pl. 7727*. Au. 1900.
Native of Bahia.

H[ooker], J. D. *Hippeastrum Harrisoni*. Curt. Bot. Mag. III. **56**: *pl. 7737*. 1 O. 1900.
Native of Uruguay.

Hough, M. Z. Plant Names of the southwestern United States. Plant World, **3**: 137–139. S. 1900.

Hyatt, J., Peck, C. H., and Porter, T. C. Reminiscences of John Torrey. Bull. Torr. Club, **27**: 559–565. 26 O. 1900.

Hus, H. T. A. Preliminary Notes on West Coast Porphyras. Zoe, **5**: 61–70. N. 1900.
Key to the species; *P. occidentalis* Setchell & Huss, new.

Jones, L. R. *Daphne Mezereum* in Vermont. Rhodora, **2**: 142. 10 Jl. 1900.

Kearney, T. H., Jr. Concerning Saxifrages. Plant World, **3**: 37, 38. Mr. 1900.

Kearney, T. H., Jr. The Plant Covering of Ocracoke Island; a Study in the Ecology of the North Carolina strand Vegetation. Contr. U. S. Nat. Herb. **5**: 261–319. *f. 33–50*. 1 Au. 1900.

Kennedy, G. G. Edwin Faxon. (With portrait.) Rhodora, **2**: 107–111. 21 Je. 1900.

Kiærskou, H. Om danske Samlere of vestindiske Planter. Bot. Tidsskrift, **23**: 35–47. 1900.

Klebs, G. Zur Physiologie der Fortpflanzung einiger Pilze.—III. Jahrb. wiss. Bot. **35**: 80–203. 1900.

Knowlton, C. H. On the Flora of Chesterville, Maine. Rhodora, **2**: 123, 124. 21 Je. 1900.

Knowlton, F. H. Notes for the Beginner in the Study of Mosses. Plant World, **3**: 145–148. *pl. 5*. O. 1900.

Koehne, E. Lythraceae novae. Engler's Bot. Jahrb. **29**: 154–160. 22 My.; 161–168. 4 S. 1900.
Several new species and varieties of *Cuphea* described, all from Mexico and South America.

Kraemer, H. Note on the Origin of Tannin in Galls. Bot. Gaz. **30**: 274, 275. 15 O. 1900.

Kuntze, O. & Post, T. von. Nomenklatorische Revision höherer Pflanzengruppen und über einige Tausend Korrecturen zu Englers Phaenogamen Register. Allg. Bot. Zeitsch. **6**: 110–120. 15 Je. 1900; 148–164. 15 Jl. 1900; 179–191. S. 1900.

Land, W. J. G. Double Fertilization in Compositae. Bot. Gaz. 30: 252–260. *pl. 15–16.* 15 O. 1900.

Leavitt, R. G. Revisions in *Berberis* and *Sagittaria.* Rhodora, 2: 149–155. *pl. 19.* Jl. 1900.

Lehmann, F. C., & Kränzlin, F. *Mormodes Oberlanderianum.* Gard. Chron. III. **28**: 317, 318. *f. 96.* 3 N. 1900.

A new orchid from South America.

Lindau, G. Acanthaceae. Symbolae Antillanae **2**: 170–250. 20 O. 1900.

Ancitranthus and *Centrilla* gen. nov. Synopsis of West Indian species.

Livingston, B. E. On the Nature of the Stimulus which causes the Change of Form in polymorphic green Algae. Bot. Gaz. **30**: 289–317. *pl. 17, 18.* 15 N. 1900.

Lloyd, F. E. The Douglas Spruce, *Pseudotsuga taxifolia.* Plant World, **3**: 65–68. *pl. 2.* My. 1900; 85–87. Je. 1900.

Loesener, T. Beiträge zur Kenntniss der Flora von Central Amerika (entschliesslich Mexico).—II. Engler's Bot. Jahrb. **29**: 86–106. 22 My. 1900.

New species in *Piper*, *Peperomia*, *Quercus*, *Microtropis*, *Gyminda*, *Cereus*, and *Hyptis*, described by C. De Candolle, O. von Seemen, K. Schumann and the author.

MacDougal, D. T. The New York Botanical Garden. Pop. Sci. Mo. **57**: 171–178. Je. 1900. [Illust.]

MacMillan, C. Observations on *Lessonia.* Bot. Gaz. **30**: 318–334. *pl. 19–21.* 15 N. 1900.

Masters, M. T. *Passiflora europhylla.* Gard. Chron. III. **28**: 350. 17 N. 1900.

A new species from British Guiana.

Maxon, W. R. Notes on American Ferns.—II. Fern. Bull. **8**: 58, 59. Jl. 1900.

Maxon, W. R. The Hart's-tongue in New York and Tennessee. Plant World, **3**: 129–132. S. 1900. [Illust.]

Macomb, A. The Development of the karyokinetic Spindle in vegetative Cells of higher Plants. Bull. Torr. Club, **27**: 451–459. *pl. 24, 25.* 6 S. 1900.

McDonald, H. E. A Sand Dune Flora of Central Illinois. Plant World, **3**: 101–103. Jl. 1900.

Mez, C. Lauraceae et Bromeliaceae novae. Symbolae Antillanae, **2**: 251–256. 20 O. 1900.

New species in *Ocotea*, *Bromelia*, *Hohenbergia*, and *Tillandsia.*

Nathansohn, A. Physiologische Untersuchungen ueber amitotische Kerntheilung. Jahrb. wiss. Bot. **35**: 48–79. *pl. 2, 3.* 1900.

Nelson, A. Popular Ignorance concerning Botany and Botanists. Plant World, **3**: 33–36. Mr. 1900.

Nelson, A. The Cyptogams of Wyoming. Ann. Rep. Wyo. Exp. Sta. **10**: —— (3–38). 1900.

Nordhausen, M. Ueber basale Zweigverwachsungen bei *Cladophora* und über die Verzweigungswinkel einiger monosiphoner Algen. Jahrb. wiss. Bot. **35**: 366–406. *pl. 11.* 1900.

Osterhout, G. E. New Plants for Colorado. Bull. Torr. Club, **27**: 506–508. 29 S. 1900.

Allium rubrum, Allium arenicola, Artemisia Coloradensis, Artemisia spiciformis, Artemisia cana viscidula and *Agoseris montana* new species and variety.

Osterhout, G. E. A Correction. Bull. Torr. Club, **27**: 539. 26 O. 1900.

Allium sabulicola substituted for *A. arenicola.*

Pammel, L. H. The Twin-leaf (*Jeffersonia diphylla*) in Iowa. Plant World, **3**: 41. Mr. 1900.

Parish, S. B. Contributions to Southern California Botany.—I. Zoe, **5**: 71–76. N. 1900.

New species in *Gilia, Eupatorium* and *Bidens.*

Pollard, C. L. A new Southern Violet. Proc. Biol. Soc. Washington, **13**: 169. 31 O. 1900.

V. Alabamensis.

Pollard, C. L. A Visit to the Home of *Neviusia.* Plant World. **3**: 136, 137. S. 1900.

Porter, T. C. A new Variety of *Azalea nudiflora* L. Bull. Torr. Club, **27**: 508. 29 S. 1900.

Azalea nudiflora glandifera var. nov.

Porter, T. C. The Twin-flower (*Linnaea borealis*) in Pennsylvania. Plant World, **3**: 133, 134. S. 1900.

Preston, C. E. Non-sexual Propagation in *Opuntia.* Bot. Gaz. **30**: 351. 15 N. 1900.

Preston, C. E. Observations on the Root System of certain Cactaceae. Bot. Gaz. **30**: 348–351. 15 N. 1900.

Price, S. F. Abnormal Leaves and Flowers. Plant World, **3**: 53. *f. 1.* Ap. 1900.

Ramaley, F. The Seed and Seedling of the Western Larkspur (*Delphinium occidentale* Wats.). Minn. Bot. Stud. **2**: 417–421. *pl. 28.* 15 Au. 1900.

Reiche, K. Beiträge zur Systematik der Calyceraceen. Engler's Bot. Jahrb. **29**: 107–119. *pl. 1.* 22 My. 1900.

Robertson, R. A. Variations in *Lycopodium clavatum* Linn. Trans. Bot. Soc. Edinb. **21**: 290–298. *pl. 1–3.* 1900.

Rodrigue, A. Les feuilles panachées et les feuilles colorées. (Rapports entre leurs couleurs et leur structure.) Mém. Herb. Boissier, **17**: 11–75. 30 Je. 1900.

Several American species among those studied.

Rossler, W. Beiträge zur Kleistogamie. Flora, **87**: 479–499. *pl. 16, 17.* 5 O. 1900.

An investigation of *Juncus bufonius* L., and *Oxalis Acetosella* L.

Rothert, W. Die Krystallzellen der Pontederiaceen. Bot. Zeitung. **58**[1]: 75–106. *pl. 4.* 1 Je. 1900.

Rusby, H. H. The botanical Origin of Coca Leaves. Druggist's Circ. and Chem. Gaz.: 220–223. *f. 1–16.* N. 1900.

Rydberg, P. A. Studies on the Rocky Mountain Flora, II. The Rocky Mountain Species of Melanthaceae. Bull. Torr. Club, **27**: 528–538. 26 O. 1900.

Stenanthella gen. nov., *Stenanthella occidentalis* (Gray) Rydb. nom. nov., *Tofieldia intermedia, Veratrum speciosum, Zygadenus Coloradensis, Z. gramineus, Z. intermedius, Z. acutus,* and *Z. falcatus,* new species.

Salmon, E. S. Bryological Notes. Rev. Bryol. **27**: 59–61, 80–83. 1900.

Includes note on *Erpodium Domingense* (Spreng.) Brid.

Salmon, E. S. The Erysiphaceae of Japan. Bull. Torr. Club, **27**: 437–450. *pl. 26.* 6 S. 1900.

Sargent, H. E. A new *Vicia* for New England. Rhodora, **2**: 225. N. 1900.

Saunders, C. F. Does the catch-fly Grass catch Flies? Plant World, **3**: 104. Jl. 1900.

Saunders, C. F. Etymology of Columbine. Plant World, **3**: 107, 108. Jl. 1900.

Saunders, C. F. New Jersey Pine Barrens in July. Plant World, **3**: 1–4. Ja. 1900. [Illust.]

Saunders, C. F. Quaker Bridge, New Jersey. Plant World, **3**: 124. Au. 1900. [Illust.]

Saunders, C. F. Root System of the snake-mouth Pogonia. Plant World, **3**: 123, 124. Au. 1900. [Illust.]

Saunders, C. F. Some local common Names of Plants. Plant World, **3**: 132, 133. S. 1900.

Saunders, C. F. The small Mistletoe in Pennsylvania. Plant World, **3**: 60. Ap. 1900.

Schrenk, H. von. Two Diseases of Red Cedar, caused by *Polyporus juniperinus* n. sp. and *Polyporus carneus* Nees. Bull. U. S. Dept. Agric. (Div. Veg. Phys. & Path.) **21**: 1–22. *pl. 1–7.* 1900.

Schuh, R. E. *Rhadinocladia*, a new Genus of brown Algae. Rhodora, **2**: 111, 112, *pl. 18.* 21 Je. 1900.

Rhadinocladia Farlowii n. sp.

Schumann, K. Musaceae. Das Pflanzenreich, **4**[45]: 1–45. *f. 1–10.* 1900.

Includes descriptions of all American species.

Schütt, F. Centrifugale und simultane Membranverdickungen. Jahrb. wiss. Bot. **35**: 470–534. *pl. 12.* 1900.

Schütt, F. Die Erklarung des centrifugalen Dickenwachstums der Membran. Bot. Zeitung, **58**[2]: 246–273. *pl.* 16 Au. 1900.

Scofield, C. S. Some preliminary Observations on *Dictyophora Ravenelii* Burt. Minn. Bot. Stud. **2**: 525–536. *pl. 29–31.* 15 Au. 1900.

Seemen, O. von. Zwei neue Salices aus der Sammlung: "Plants of Southern Colorado collected and distributed by C. F. Baker, F. S. Earle and S. M. Tracy." Engler's Bot. Jahrb. Beiblatt, **29**: 28, 29. 4 S. 1900.

Salix pseudolapponum and *S. aemulans.*

Setchell, W. A. Critical Notes on the New England Species of *Laminaria.* Rhodora, **2**: 115–119, 142–149. 21 Je., 10 Jl., 1900.

Sodiro, A. Plantae ecuadorenses.—II. Compositae (by G. Hieronymus). Engler's Bot. Jahrb. **29**: 1–85. 22 My. 1900.

New species in *Vernonia, Piptocarpha, Picqueria, Ophryosporus, Stevia, Eupatorium, Mikania, Aster, Euglion, Baccharis, Gnaphalium, Clibadium, Polymnia, Wulfia, Zaluzania, Aspilia, Helianthus, Vigniera, Spilanthes, Verbesina, Narvalina, Calea, Tridax, Jaumea, Artemisa, Liabum, Culcitium, Gynoxys, Senecio, Lycoseris, Barnadesia, Mutisia, Jungia* and *Crepis.*

Solms-Laubach, H. Graf zu. Cruciferenstudien. Bot. Zeitung, **58**[1]: 167–190. *pl. 7.* 1 O. 1900.

Spegazzini, C. Fungi Argenti novi v. critici. Anales del Mus. Nac. Buenos Aires, **6**: 81–365. *pl. 4, 5.* 1899.

New species in *Lepiota,* (19), *Armillaria* (4), *Tricholoma* (3), *Clitocybe, Mycena* (6), *Omphalia* (2), *Pleurotus, Marasmius* (7), *Lentinus, Lenzites, Volvaria, Annularia, Pluteus, Volvariella* gen. nov., *Entoloma, Eccilia, Claudopus, Pluteolus, Pholiota* (3), *Inocybe* (5), *Hebeloma* (2), *Flammula* (3), *Naucoria* (6), *Galera* (3), *Tubaria* (3), *Paxillus, Bolbitius* (2), *Agaricus* (7), *Stropharia* (2), *Hypholoma,*

Psilocybe, *Deconica*, *Psathyrella* (3), *Coprinus* (8), *Montagnites*, *Polyporus* (3), *Fomes*, *Polystictus* (4), *Poria* (5), *Trametes* (4), *Daedalea* (2), *Favolus* (2), *Hydnum*, *Irpex*, *Cladoderris*, *Stereum*, *Corticium*, *Hypochnus*, *Cyphella* (2), *Albofiella* gen. nov., *Cyathus*, *Gyrophragmium*, *Podaxon*, *Chlamydopus* gen. nov. (2), *Batarrea* (2), *Geaster* (4), *Lycoperdon* (2), and many others.

Stephani, F. Beiträge zur Lebermoos-Flora Westpatagoniens und des Südlichen Chile. Bihang till k. Svenska. Vet. Akad. Handl. **26**[5]: 1–69. 1900.

New species in *Metzgeria*, *Pallavicinius*, *Jamesoniella*, *Jungermannia*, *Lophozia*, *Tylimanthus*, *Plagiochila* (9), *Clasmatocolea*, *Lophocolea* (16), *Chiloscyphus* (2), *Saccogyna*, *Alobiella*, *Cephaloziella* (2), *Lepidozia* (3), *Isotachis*, *Mastigophora*, *Trichocolea*, *Schistochila* (2), *Radula* (2), *Cololejeunea* (2), *Colejeunea* (2), *Frullania* and *Anthoceros*.

Strasburger, E. Einige Bemerkungen zur Frage nach der "doppelten Befruchtung" bei den Angiospermen. Bot. Zeitung, **58**[2]: 293–316. 1 O. 1900.

Sutor, J. H. Railroad Forestry. Railway Age, **30**: 73, 74. 27 Jl. 1900.

A discussion of tree-planting for American railroads.

Ternetz, C. Protoplasmabewegung und Fruchtkörperbildung bei *Ascophanus carneus* Pers. Jahrb. wiss. Bot. **35**: 273–312. *pl. 12.* 1900.

Trelease, W. The Preservation and Protection of native Vegetation. Plant World, **3**: 108. Jl. 1900.

Urban, I. Leguminosae novae vel minus cognitae.—I. Symbolae Antillanae, **2**: 257. 20 O. 1900.

New species in *Pithecolobium*, *Calliandra*, *Leucaena*, *Schrankia*, *Caesalpinia*, *Peltophorum*, *Hebestigma* (gen. nov.), *Poitaea*, *Desmodium*, *Rhodophis* (gen. nov.) and *Galactia*.

Urban, I. Mantissa ad Cyperaceas Clarkeanas. Symbolae Antillanae, **2**: 163–169. 20 O. 1900.

Urban, I. Über einige südamerikanische Umbellifer-Gattungen. Engler's Bot. Jahrb. Beiblatt, **29**: 1, 2. 4 S. 1900.

Urban, I. Über mexicanische Turneraceen. Engler's Bot. Jahrb. Beiblatt, **29**: 3, 4. 4 S. 1900.

Van Wisselingh, C. Ueber Kerntheilung bei *Spirogyra*. Flora, **87**: 355–377. *pl. 15.* 5 O. 1900.

Wainio, E. A. Reactiones Lichenum a J. Müllero Argoviensi descriptorum. Mém. Herb. Boissier, **5**: 1–17. 31 Ja. 1900.

Ward, L. F. Elaboration of the Fossil Cycads in the Yale Museum. Am. Jour. Sci. IV. **10**: 327–345. *pl. 1–4.* N. 1900.

Seven new species of *Cycadeoidea* from the Black Hills and Wyoming described and figured.

Webber, H. J. Xenia, or the immediate Effect of Pollen, in Maize. Bull. U. S. Dept. Agric. (Div. Veg. Phys. and Path.) 22: 1–44. *pl. 1–4.* 12 S. 1900.

Webster, H. *Naucoria Christinae.* Rhodora, 2: 127–130. 21 Je. 1900.

Wetzstein, A. Range Extension of *Iris hexagona.* Plant World, 3: 92. Je. 1900.

Wetzstein, A. The velvet Dogbane in Ohio. Plant World, 3: 40, 41. Mr. 1900.

Wheeler, W. A. A Contribution to the Knowledge of the Flora of Southeastern Minnesota. Minn. Bot. Stud. 2: 353–416. *pl. 21–27.* 15 Au. 1900.

The plates contain 14 photogravures of Minnesota vegetation.

Wiegand, K. M. *Juncus tenuis* Willd. and some of its North American Allies. Bull. Torr. Club, 27: 511–527. 26 O. 1900.

J. interior, J. Arizonicus, J. Arizonicus curtiflorus, J. brachyphyllus, J. tenuis anthelatus, and *J. Dudleyi,* new species and varieties. *J. occidentalis* nom. nov.

Williams, R. S. Another Note on *Buxbaumia.* Bull. Torr. Club, 27: 539. 26 O. 1900.

Winkler, H. Ueber Polarität, Regeneration, und Heteromorphose bei *Bryopsis.* Jahrb. wiss. Bot. 35: 449–469. *f. 1–3.* 1900.

SUBJECT INDEX

Alaska, List of Pteridophyta collected in, 637.
Asplenuim hitherto referred to A. Trichomanes var. incisum Moore, A new, 197.
Azalea nudiflora L., A new variety of, 508.

Bryological Notes, 648.
Buxbaumia, Another note on, 539.

Cabomba Caroliniana A. Gray, Notes on, 86.
California, Three new Charas from, 299.
Californiens, Beiträge zur Flechten-Flora Süd, 642.
Carnation rust, Darluca upon, 289.
Celtis pumila Pursh, and Notes on Allied Species, 496.
Charas from California, Three new, 299.
Colorado, New Plants from, 506, 539.
Coloration of Leaves, Autumnal, 200.
Crystals in Datura Stramonium, The, 37.

Darluca upon Carnation Rust, 289.
Datura Stramonium L., The Crystals in, 37.

Eleutera Beauv. (Neckera Hedw.), A Revision of the North American Species of, 202.
Eragrostis and Setaria, Some monstrosities in spikelets of, 85.
Erysiphaceae of Japan, The, 437.
Erythronium, Vegetative reproduction and multiplication in, 305.

Flechten-Flora Süd-Californiens, Beiträge zur, 642.
Florida Fungi, Some, 120.
Fungi from various localities, New species of, 571.
Fungi, New species of, 14, 49, 282, 571, 609.
Fungi of Austin, Texas, and vicinity, 579.
Fungi, Some Florida, 120.

Georgia, Notes on the flora of Middle, 320.
Georgia, Notes on the flora of South, 413.
Globulina, A new species of, 402.
Greenland, Catalogue of plants collected in, 63.
Grimmia from Montana, two new species of, 316.

Hawaiian Islands, A new genus of Hepaticae from the, 97.
Helianthemum, heteromorphism in, 589.
Hepaticae from the Hawaiian Islands, A new genus of, 97.
Heteromorphism in Helianthemum, 589.

Idaho, New plants from, 342.
Irritability, A peculiar case of contact, 190.

Japan, The Erysiphaceae of, 437.
Juncus tenuis Willd., and some of its North American Allies, 511.

Karyokinetic spindle in vegetative cells of higher plants, The development of, 451.

Leaves, Autumnal coloration of, 200.
Lichens of Southern California, 642.
Lycopodium of North America, A review of the species of, 147.

Montana, Two new species of Grimmia from, 316.
Mycelia, Turgidity in, 1.

New and noteworthy Northwestern plants, 392.
New plants from Colorado, 506, 539.
New plants from Idaho, 342.
New plants from Wyoming, 32, 258.
New species of Fungi, 14, 49, 120, 282, 571, 609.
North American Plants, Notes and descriptions of, 275.
Northwestern plants, new and noteworthy, 392.

Panicum, A criticism on certain new species of, 593.
Pezizineae, the Classification of the fleshy, 463.
Plantago, commonly referred to Plantago Patagonica, A revision of the species of, 105.
Plowrightia morbosa spores, Variations in the maturing of, 287.
Pohlia (Cacodon) porosa sp. nov., 318.
Primula, Some notes on Saxifraga and, 388.
Prunus insititia, What is, 195.
Pseudoleskea, Revision of the North American species of, 221.
Pteridophyta collected in Alaska, List of the, 111.

Rocky Mountain Flora, Studies on the, 169, 528, 614.

Saururus cernuus L., On the development of, 365.
Saxifraga and Primula, Some notes on, 388.
Sisyrinchium, Studies in, 237, 373.
South America, Enumeration of plants collected by Dr. H. H. Rusby in, 22, 69, 124.
Southwestern plants, Notes of some, 87.

Texas, Fungi of Austin, 579.
Torrey, as a Botanist, Dr., 540.
Torrey Botanical Club, The work of the, 552.
Torrey, Reminiscences of John, 559.
Turgidity in mycelia, 1.

Willows, North American, 247.
Wyoming, New plants from, 32, 258.

GENERIC INDEX

ABIES, 49, 293, 294.
Acanthospermum, 341, 421.
Acalypha, 327, 329, 421.
Acanthus, 371.
Acer, 57, 323–325, 336, 417, 446, 575.
Acerates, 327, 420, 423.
Acetabula, 473, 491.
Achillea, 54, 329.
Achimenes, 27.
Aconitum, 443.
Acromastigum, 103.
Acrostichum, 90.
Actinidia, 445, 447.
Actinomeris, 323.
Actinostachys, 90.
Actinostemma, 440.
Adenocalymna, 72.
Adenocaulon, 446.
Adiantum, 324, 425.
Adicea, 324.
Adopogon, 322, 328.
Aecidium, 63, 586.
Aegiphila, 81.
Aesculus, 326, 422.
Afzelia, 420.
Agaricus, 16, 587.
Agave, 51, 328, 419, 571, 574.
Agrimonia, 322, 422, 428, 446, 557.
Agropyron, 35, 292, 293.
Agroseris, 507, 576.
Agrostemma, 329.
Agrostis, 293.
Ajuga, 43, 446.
Albizzia, 421.
Albugo, 586.
Alchemilla, 329, 335.
Aleuria, 466.
Aletris, 418, 423, 424.
Alguelagum, 84.
Alisma, 322.
Allionia, 278.
Allium, 276, 286, 312, 323, 355, 451, 453, 454, 457, 458, 506, 539.
Alloplectus, 29, 30.
Alnus, 293, 323, 324, 417, 440, 444, 445, 447.
Alvusoa, 24.
Alopecurus, 67, 293.
Aloysia, 80.
Alsine, 294, 325, 329, 334, 421.
Amanita, 14, 15, 587, 609.
Amanitopsis, 15, 587, 610.
Amarantus 329, 421, 561, 586.
Ambrosia, 329, 421.
Amelanchier, 41, 323, 392, 417, 445.
Amellus, 621.
Amianthium, 537.
Amorpha, 429.
Ampelopsis, 422.
Amphicarpaea, 444.
Amphisphaeria, 52.
Amsonia, 326, 420.
Anagallis, 329.
Anastrophyllum, 98.
Andropogon, 53, 292, 327, 419, 421.
Anemia, 90.
Anemiopsis, 365.
Anemone, 325–327, 574, 585.
Angelica, 420.
Aniba, 133.
Anogra, 267.
Antennaria, 67, 177, 178, 326, 347, 402, 404.
Anthemis, 329, 421.
Anthocercis, 39.
Anthophara, 89.
Anthostoma, 63.
Anthostomella, 63.
Anychia, 329.
Apeiba, 291.
Aphanthe, 438, 446, 447.
Aphelandra, 76, 77.
Apios, 417.
Aplopappus, 346, 614–619, 621, 623–627.
Aquilegia, 57, 60.
Apocynum, 327, 420.
Arabis, 66, 323, 328, 334.
Arachnopeziza, 484, 493.
Aralia, 417, 422.
Arctium, 329. 446.
Arctostaphylos, 66.
Arcyria, 587.
Areca, 140.
Arenaria, 65, 294, 328, 334, 343.
Arisaema, 324, 417, 586.
Aristida, 122.
Armeria, 66.
Arnica, 67.
Armillaria, 610, 611.
Arrabidaea, 69.
Arrhostoxylum, 74.
Artemisia, 34–36, 67, 274, 276, 292, 342, 506, 507.
Arthonia, 646.
Artothelium, 646.
Arundinaria, 323, 416.
Asarum, 371.

Asclepias, 326, 327, 418, 420, 424, 433.
Asclepiodora, 585.
Ascobolus, 60, 464–466, 468, 481, 492, 582.
Ascocalathium, 470.
Ascochyta, 56, 573.
Ascodesmis, 470.
Ascomyces, 469.
Ascophanus, 492, 587.
Ascophyllum, 599.
Ascyrum, 328, 418, 420, 430.
Asimina, 58, 323, 326, 422.
Asparagus, 585.
Aspergillus, 284.
Asplenium, 197–199, 324, 417.
Aster, 41, 89, 326, 327, 345, 423, 435, 557.
Asterella, 120.
Asterina, 51, 120, 571.
Astraeus, 587.
Astragalus, 292, 444.
Athyrium, 637.
Atriplex, 127, 293.
Atropa, 37, 39.
Avena, 85, 292, 293.
Aydendron, 133.
Azalea, 323, 324, 417, 508.

BALANSIA, 585.
Baldwinia, 418.
Balsamorrhiza, 627–630.
Baptisia, 326, 419, 429.
Barlaea, 474, 491, 495.
Bartonia, 330, 418.
Bartsia, 26.
Batrachium, 293.
Bazzania, 97, 100, 103.
Belonidium, 485, 493.
Beloniella, 488, 493, 495.
Belonioscypha, 492.
Belonium, 492.
Belonopsis, 493.
Beloperone, 77, 78.
Berberis, 444, 582, 585.
Berchemia, 416.
Berlandiera, 420.
Besleria, 31, 69.
Betula, 20, 67, 91, 293, 323, 417, 445.
Bidens, 329, 421, 632.
Bigelovia, 342.
Bignonia, 69–72, 323, 326.
Blephilia, 326, 340.
Boehmeria, 324, 416.
Boerhaavia, 125, 329, 334, 421, 586.
Bolbitius, 587.
Boletinus, 613.
Boletus, 17–19, 587, 612.
Botrychium, 40, 324, 416.
Botrytis, 8–11.
Bouchea, 80.
Boudiera, 492.
Boussingaultia, 127, 128.
Bouteloua, 292, 585, 586.
Bovistella, 588.
Bradburya, 420.
Brasenia, 371, 415.
Braya, 343.
Breweria, 328, 420, 423, 424, 433.
Broussonetia, 445.
Brunfelsia, 23.
Buchloe, 292.
Bulgaria, 446.
Bupthalmium, 628.
Buxbaumia, 539.
Bystropogon, 83.

CABOMBA, 86.
Cactus, 292.
Calamagrostis, 67, 293.
Calamintha, 326, 446.
Calceolaria, 23, 24.
Callicarpa, 420.
Callichlamys, 73.
Calliopsis, 89.
Callitriche, 322.
Calloria, 493.
Calochortus, 355, 356.
Calophanes, 420.
Caltha, 444.
Calvatia, 588.
Calycanthus, 323.
Camarosporium, 56, 57.
Campanula, 66, 67, 340.
Camphora, 123.
Campulosus, 418, 423.
Cantharellus, 587.
Capnoides, 203.
Capraria, 25.
Capriola, 421.
Capsella, 329.
Cardamine, 66, 329, 421.
Carduus, 327, 329.
Carex, 67, 292, 322, 324, 325, 328, 416, 418, 422, 426.
Carpesium, 446.
Carpinus, 323, 416.
Caryota, 140.
Cassia, 213, 419, 421.
Cassiope, 66.
Castalia, 330, 415.
Castanea, 325, 326, 333, 419, 444.
Castelia, 80.
Castilleja, 26, 269, 270, 353, 398, 399.
Casuarina, 42, 365.
Catabrosa, 67, 85.
Catalpa, 323, 371, 417, 434.
Caucalis, 444.
Ceanothus, 326, 420, 424, 430.
Cebatha, 327.
Celastrus, 447.
Celtis, 437–439, 446, 447, 496–505, 584.
Cenangium, 51.

Cenchrus, 419, 586.
Cephalanthus, 40, 139, 323, 417.
Cephalozia, 98.
Ceranthera, 433.
Cerastium, 65, 66, 328, 329, 334.
Cercis, 326, 417.
Cercospora, 56, 577.
Cercosporella, 578.
Cestrum, 22.
Chaerophyllum, 329.
Chaetochlamys, 78.
Chaetochloa, 421.
Chamaelirium, 324.
Chamaenerium, 65.
Chamaeraphis, 85, 86.
Chara, 299–304.
Cheilanthes, 328.
Chelone, 324.
Chelonopsis, 443.
Chenopodium, 127, 292, 333, 421.
Chimaphila, 326.
Chiodecton, 646.
Chionanthus, 323, 417, 431.
Chionophila, 352, 353.
Chironia, 432.
Chioscographia, 213.
Chlorosplenium, 482, 492, 495.
Chondrophora, 423, 424.
Chrosperma, 419.
Chrysanthemum, 329.
Chrysogonum, 327.
Chrysopsis, 328, 395, 396, 420, 616.
Chrysothamnus, 292.
Ciboria, 492.
Cimicifuga, 325, 334.
Cinnamomum, 282, 283.
Cirsium, 348.
Citharexylon, 81.
Citrosma, 133.
Cladosporium, 284, 285.
Clausena, 283.
Clavaria, 584, 587, 649.
Claytonia, 258–260, 294.
Clematis, 415, 416, 419, 428, 444, 552.
Cleome, 292.
Clerodendron, 82.
Clethra, 416.
Climacium, 649.
Clitocybe, 19, 587.
Clitopilus, 587.
Clitoria, 327, 420.
Cnicus, 446.
Cochlearia, 66.
Coccoloba, 129, 576.
Cocos, 140.
Coleosporium, 586.
Colletotrichum, 283.
Collignoma, 125.
Collinsia, 353.
Collinsonia, 419.
Colpodium, 67.
Columnea, 30, 31.
Commelina, 327, 416, 419, 586.
Conoclinium, 417.
Convolvulus, 326.
Coprinus, 582, 586, 588.
Corallorhiza, 91.
Cordyceps, 21.
Coreopsis, 327, 328, 341, 405, 418, 420, 423, 424, 436, 631.
Cornus, 323, 326, 416, 439, 444.
Corouopus, 329, 421.
Corticium, 49.
Corydalis, 203.
Corylus, 324, 325, 439, 444.
Coryne, 485, 493.
Cotyledon, 214.
Cracca, 327, 424.
Crataegus, 58, 91, 326, 327, 335.
Crotalaria, 327, 419, 424.
Croton, 336, 421.
Crotonopsis, 328.
Cryptanthe, 292.
Cryptocarpus, 127.
Cryptocarya, 133.
Cryptogramma, 637.
Cryptopodia, 202, 205.
Cubonia, 492.
Cucurbita, 372.
Cuscuta, 339, 420, 421, 433.
Cyathicula, 482, 483, 492.
Cyathus, 586, 587.
Cylindrosporium, 58, 575.
Cynoctonum, 416, 418, 431.
Cyperus, 122, 322, 418, 419, 421.
Cypripedium, 333, 502.
Cyrilla, 417.
Cyrthanthus, 213.
Cystopteris, 68.
Cytispora, 63.

DACRYOMYCES, 50, 587.
Dactyloctenium, 421.
Daltonia, 206, 210, 211.
Danthonia, 323, 325.
Darlingtonia, 560.
Darluca, 289, 290.
Dasyscypha, 60, 493.
Dasystoma, 326, 420, 422.
Datura, 37, 39, 329, 421.
Daucus, 327, 329, 338, 421.
Decodon, 417.
Decumaria, 324.
Delitschia, 407.
Delphinium, 89, 261–264, 327.
Dentaria, 325.
Desmazierella, 493.
Desmodium, 56.
Detonia, 491.
Diamorpha, 328, 334.
Dianthera, 417.
Diapensia, 66.

Diastemma, 28.
Dicerandra, 420, 433.
Dichaena, 122.
Dichromena, 423, 424.
Didymodon, 648.
Diervilla, 440, 443.
Diodia, 417, 421, 586.
Diospyros, 327, 422.
Dionaea, 157.
Dioscorea, 324, 422.
Diplocladium, 58.
Diplodia, 56.
Diplolegnon, 29, 30.
Diplopappus, 559.
Dirca, 55.
Dirina, 642–644.
Discina, 472, 478, 491.
Discosia, 62.
Distichia, 202, 211.
Dolicholus, 420.
Dondia, 293.
Donia, 626, 627.
Dothichloe, 121.
Dothidea, 121.
Dothidella, 571.
Dothiorella, 55.
Draba, 66, 264, 329.
Drosera, 309, 330, 418, 428, 599.
Dryas, 65.
Dryopteris, 40, 556, 638.
Duchesnea, 329.
Dulichium, 416.

ECHINODONTIUM, 49.
Eclipta, 322.
Eleagnus, 338.
Eleocharis, 322, 323, 415, 416, 419, 426.
Elephantopus, 326, 422.
Eleusine, 421.
Eleutera, 202–210.
Elsholtzia, 443.
Elymus, 67, 292, 293.
Elytraria, 74.
Empetrum, 65.
Endlichera, 133.
Entodon, 649.
Entylomia, 576.
Ephedra, 52, 457.
Epigaea, 407.
Epilobium, 60, 445.
Epiphegus, 422, 434.
Equisetum, 53, 68, 640.
Eragrostis, 85, 86, 322.
Eranthemum, 75.
Erechthites, 419.
Erigeron, 33, 34, 55, 67, 293, 326, 329, 341, 395, 396, 419, 421, 427.
Erinella, 493.
Erinus, 25.
Eriocarpum, 620–622.
Eriocaulon, 213, 330, 418.
Eriogonum, 292.
Eriopeziza, 493.
Eriophorum, 67.
Eryngium, 419.
Erysiphe, 402–404, 406, 440–443.
Erythronium, 305–315, 453.
Euonymus, 326.
Eupatorium, 325, 327, 341, 418, 420.
Euphorbia, 137, 292, 329, 420, 421, 430, 585.
Eurota, 292.
Evax, 341.
Exoascus, 469
Exosporium, 55, 59.

FABIANA, 22.
Fabraea, 493.
Fagelia, 23, 24.
Fagopyrum, 443.
Fagus, 323, 333, 417, 427, 434.
Falcata, 324, 422.
Fatoua, 446.
Fedia, 184.
Festuca, 68, 293.
Ficus, 285, 286, 586.
Filago, 329, 341.
Filotrichum, 205.
Filix, 638.
Fimbristylis, 328, 419.
Fistulina, 21.
Fomes, 49.
Fontinalis, 205, 210, 211.
Forenia, 25.
Fragaria, 327.
Franciscea, 23.
Frasera, 52, 53.
Fraxinus, 49, 63, 323, 417, 431, 445, 447, 573.
Froelichia, 419, 427.
Fucus, 599.
Fuirena, 418.
Fusarium, 285.

GAILLARDIA, 420.
Galactia, 424.
Galactinia, 473, 491.
Galax, 54, 338.
Galbesia, 24.
Galium, 322, 340, 420, 422.
Gardoquia, 84.
Gaura, 420, 585.
Geaster, 587.
Gelsemium, 321.
Gentiana, 324, 326.
Geopyxis, 473, 491.
Geranium, 325, 329, 446, 586.
Gerardia, 25, 326, 405, 418, 419, 423, 424, 434.
Gesnera, 27–29.
Geum, 572.
Gilia, 294, 327, 339.

Globulina, 402–404.
Gloeosporium, 62, 282–284, 286.
Glottidium, 418, 429.
Gnaphalium, 54, 327.
Gonolobus, 585.
Gorgoniceps, 492.
Gratiola, 322, 418, 423, 434.
Grimmia, 316, 317, 649.
Guepinia, 20, 587.
Gymnosporangium, 582, 585.
Gymnopogon, 424.
Gyrophragmium, 584, 588.
Gyrostachys, 418, 422, 423.
Gyrotheca, 423, 424.

HABENARIA, 275, 324, 416, 418, 423, 424.
Hadotrichum, 59.
Haematococcus, 139.
Haematomyxa, 60.
Halictus, 89.
Hamamelis, 325, 407, 422, 445.
Hansteinia, 77.
Hartmania, 329, 338, 421, 431.
Hebeloma, 587.
Hedeoma, 84, 326.
Hedera, 55, 56.
Helenium, 329, 419, 421.
Helianthemum, 589–592.
Helianthus, 65, 292, 419, 420, 423, 435, 585.
Heliopsis, 327, 629.
Heliotropium, 329, 421.
Helleborus, 291.
Helminthosporium, 285.
Helonias, 407, 408, 529, 537.
Helotium, 464, 465, 467, 483, 492,
Helvella, 583, 587.
Hendersonia, 62, 282, 573.
Hepatica, 325.
Heracleum, 282.
Herberta, 97, 98.
Herniarca, 127.
Herpestis, 25.
Herpocladium, 98.
Heterosporium, 285.
Heuchera, 293, 325, 334, 571.
Hexalectris, 90, 91, 422, 427.
Hibiscus, 405, 418, 430.
Hicoria, 326.
Hieracium, 43, 275, 327, 422, 572.
Hierochloa, 67.
Holacantha, 87.
Homalia, 203, 209.
Homalocenchrus, 322, 418.
Hordeum, 85, 443, 586.
Houstonia, 326, 327, 329.
Houttuynia, 365.
Humaria, 474, 491, 586.
Hydastylus, 237, 373–387.
Hydnum, 49, 587.
Hydrangea, 325.
Hydrocotyle, 416, 423.
Hydrolea, 322, 417.
Hymenocallis, 422, 427.
Hymenochaete, 49, 50.
Hymenopappus, 632–636.
Hyoscyamus, 37, 39.
Hysterographium, 53.
Hypericum, 327, 416, 418, 420, 423, 424, 430.
Hypnum, 205, 209, 210, 224, 230–232.
Hypocrea, 121.
Hypoderma, 53.
Hypomyces, 20.
Hypoxis, 326, 422.
Hypoxylon, 56.
Hyptis, 82, 83, 434.

ILEX, 416, 417, 423.
Ilysanthes, 25, 322, 328, 419.
Impatiens, 324, 446.
Indigofera, 419, 585.
Inga, 402.
Inocybe, 587.
Ipomoea, 323, 327, 420, 421, 586.
Isnardia, 322, 416.
Isoetes, 358, 359.
Isoloma, 28.
Isopappus, 420.
Itea, 324, 415, 417.
Iris, 285, 308, 330, 416.

JACARANDA, 73.
Jacobina, 79.
Jacquemontia, 421, 433.
Jatropha, 326, 420.
Juglans, 326.
Juncoides, 324, 325, 332.
Juncus, 67, 322, 325, 328, 419, 511–527.
Juniperus, 292, 416, 425, 582, 585.
Jussiaea, 416, 431.
Justicia, 74, 78, 79.

KALLSTROEMIA, 87.
Kalmia, 294, 417, 431, 573.
Kantia, 98.
Kellermannia, 57, 574.
Kentia, 140.
Kneiffia, 327.
Koellia, 422.
Koellikeria, 27.
Koenigia, 67.
Kohlerianthus, 29.
Kraunhia, 417.
Kuhnia, 327.
Kuhnistera, 419, 429.
Kyllinga, 322, 418.

LACHNEA, 446, 478, 479, 492, 495, 586, 587.
Lachnella, 484, 493.

Lachnellula, 493.
Lachnum, 484, 493, 495.
Lacinaria, 281, 405, 420, 424, 435.
Lactarius, 20, 587.
Lactuca, 421, 446.
Lagerstroemia, 446.
Lamium, 329, 421, 443.
Lantana, 79, 80.
Laportea, 443.
Lappula, 267, 268.
Lasiobolus, 480, 492, 495, 582, 586.
Lathyrus, 576.
Laurentia, 271.
Laurus, 134.
Lecanora, 643.
Lechea, 420, 557.
Lecidea, 644.
Ledum, 66, 294.
Legouzia, 329.
Lembosia, 123.
Lemna, 293, 415.
Lentinus, 587.
Leonotis, 421, 434.
Lepidium, 292, 329, 342, 421, 586.
Lepidagathis, 76.
Lepiota, 15, 383, 587, 610.
Leptopodium, 648.
Leptosphaeria, 52.
Leptostachys, 78.
Leptothyrium, 123, 282.
Lesbia, 209.
Lescuraea, 222, 223, 232, 234.
Leskea, 223, 224, 226, 231, 232, 649.
Lespedeza, 326, 419, 421.
Leucocarpus, 24.
Leucothoe, 323, 338, 417.
Lewisia, 293.
Libertella, 283.
Licuala, 140.
Ligusticum, 326.
Ligustrum, 444, 586.
Lilium, 330, 417–419, 427, 453, 457.
Limnanthemum, 330, 415, 416.
Limnobium, 208.
Limodorum, 330, 418, 423, 424.
Linaria, 327.
Lindera, 324.
Linum, 326, 418.
Lipocarpha, 419.
Lippia, 80.
Liquidambar, 417, 422.
Liriodendron, 323–325, 416, 417.
Lithospermum, 52, 329.
Lobelia, 417, 423.
Loiseleuria, 66.
Lolium, 85.
Lonicera, 323, 340, 421.
Lophidium, 90.
Lophiostoma, 63.
Lophostachys, 75.
Loranthus, 134, 135.
Ludwigia, 322, 330, 416–418, 431.
Lundia, 69.
Lupinus, 59, 328, 343–345.
Luzula, 67, 559.
Lycoperdon, 587, 588.
Lycopodium, 68, 147–159, 161–168, 330, 406, 407, 418, 423, 425, 563, 640, 641.
Lycopus, 322.
Lygodesmia, 293, 348, 420, 436.
Lygodium, 40, 90.
Lysimachia, 322, 338.

MACFADYENA, 72.
Macounia, 230.
Macronema, 614, 618, 619.
Macrophoma, 21.
Macropodia, 476, 477, 491, 495.
Magnolia, 417, 427, 431, 445.
Malvastrum, 87, 88.
Mango, 212.
Marica, 373, 375.
Marrubium, 124.
Marsypianthes, 82.
Massariovalsa, 575.
Mastigobryum, 97, 103.
Mastigophora, 98.
Mayaca 418.
Medeola, 324.
Medicago, 329, 335.
Megachile, 89.
Meibomia, 419, 422, 424.
Melanconiopsis, 575.
Melanconis, 575.
Melanconium, 574, 575.
Melanomma, 51.
Melanthium, 418.
Melia, 329.
Melica, 325.
Melilotus, 329.
Meliola, 51.
Melissodes, 89.
Mendoncia, 74.
Menispermum, 55.
Mentha, 83, 294, 418.
Mesadenia, 327.
Mesosphaerum, 82, 83, 418, 419, 434.
Mespilodaphne, 134.
Micranthemum, 416.
Micromeria, 84.
Microseris, 348.
Microsphaera, 437, 439, 441, 442, 444.
Microtea, 128.
Mikania, 322, 324, 405, 417.
Mimulus, 24, 269, 322.
Mirabilis, 213.
Mitchella, 324, 325, 422.
Modiola, 329, 421.
Mohria, 90.
Mohrodendron, 323, 339.
Mollinedia, 133.

Mollisia, 486, 493, 495.
Mollisiella, 493.
Mollugo, 329, 421.
Monarda, 328, 420, 576.
Monniera, 25, 419, 423.
Morongia, 327, 419.
Montagnites, 584.
Morchella, 583, 587.
Morus, 323, 439, 445.
Mucor, 8–10, 586.
Mucronoporus, 49, 50.
Muhlenbeckia, 128.
Munroa, 292.
Musenium, 61.
Mycenastrum, 584, 588.
Mycosphaerella, 52.
Mycotis, 328, 334.
Myrica, 417.
Myriophyllum, 330, 415.
Myristica, 133.

NABALUS, 325.
Neckeria, 202–205, 211.
Neckeropsis, 211.
Nectandra, 134.
Neea, 126.
Nemophila, 349, 350.
Neottiella, 479, 492.
Nicotiana, 22, 23.
Nierembergia, 23.
Niptera, 493.
Nothoscordum, 3 8.
Nuphar, 371.
Nyctaginea, 278.
Nymphaea, 293, 322, 371.
Nyssa, 417, 422, 431.

OCIMUM, 82.
Ocotea, 134.
Oenothera, 278, 329.
Oldenlandia, 418.
Olea, 282–284.
Olsynium, 237.
Ombrophila, 485, 493.
Omphalia, 612.
Onagra, 421.
Onoclea, 324.
Onosmodium, 326, 420.
Opegrapha, 645.
Ophiodothis, 121, 122.
Ophioglossum, 556, 637.
Opuntia, 292, 328, 420.
Orbilia, 488, 493, 495.
Oreobroma, 260.
Orontium, 416.
Osmunda, 90, 324, 417, 418, 598.
Ostrya, 323.
Otidea, 474, 478, 491, 495.
Otidella, 491.
Ourisia, 25.
Oxalis, 327–329, 336, 421, 557.
Oxybaphus, 125, 285.
Oxydendrum, 325, 422.
Oxypolis, 324, 418.
Oxyria, 67.

PACHYSANDEA, 407.
Pachystachys, 77.
Paeonia, 440, 443.
Panaeolus, 586.
Panax, 325, 338.
Panicum, 53, 294, 325, 419, 426, 593–597.
Panus, 587.
Papaver, 66.
Parnassia, 324, 335.
Paronychia, 419, 427.
Parthenocissus, 326, 417, 422.
Paspalum, 322, 416, 419.
Passiflora, 327, 417, 421.
Patellaria, 465, 466.
Paulownia, 340, 445.
Pedicularis, 66, 325, 422.
Peltandra, 322, 324.
Peltigera, 20.
Penicillium, 8–11.
Pentacaena, 127.
Penthorum, 324, 416.
Pentstemon, 61, 327, 352, 353, 396, 397.
Peperomia, 131–133, 366, 371.
Periconia, 586.
Perilomia, 124.
Peronospora, 586.
Persea, 134, 422.
Pestalozzia, 58, 575, 576.
Petalostemon, 429.
Petiveria, 128.
Petrea, 81.
Peucedanum, 444.
Peumus, 133.
Peziza, 464–468, 475, 477, 478, 491, 494, 586.
Pezizella, 492.
Phacelia, 293, 327, 351.
Phaeopezia, 479.
Phallus, 583, 587.
Phaseolus, 372, 422.
Phegopteris, 638.
Philadelphus, 57, 323.
Phialea, 466, 482, 492.
Phleum, 293.
Phlox, 279, 326.
Phlyctaena, 56.
Phoenix, 140.
Phoma, 54, 56, 573.
Phoradendron, 135–137, 422.
Phrygilanthus, 134.
Phthirusa, 135.
Phyllachora, 58.
Phyllactinia, 437–439, 441, 442, 445.
Phyllanthus, 278, 324.
Phyllodoce, 66, 294.

Phyllosticta, 54, 59, 571, 572.
Physalis, 327, 420, 421.
Phytolacca, 128, 329, 421.
Picea, 293, 409, 556.
Picrasma, 444.
Pieris, 418.
Pilacre, 59.
Pilea, 443.
Pilobolus, 586.
Pilotrichum, 204, 210, 211.
Pinckneya, 417, 435.
Pinguicula, 27, 599.
Pinus, 292–294, 343, 351, 419, 423, 424.
Piper, 130–132, 212.
Pirottaea, 493.
Pirus, 54, 56.
Pisaria, 125.
Pisum, 57.
Pitya, 483, 492.
Plagiothecium, 649.
Plantago, 105–119, 125, 327, 329, 371, 421, 443.
Platanus, 323.
Platygrapha, 645.
Plectania, 491.
Pleonotoma, 72.
Pleospora, 53.
Pleurozia, 98.
Plowrightia, 287.
Pluchea, 275, 324, 341, 417, 423.
Poa, 67, 292, 293, 324, 330, 574.
Pocillum, 492.
Podophyllum, 323.
Podosphaera, 441, 442, 445.
Podospora, 407.
Pogonia, 418, 432.
Pohlia, 318.
Polygala, 418, 420, 423, 424, 429, 432.
Polygonatum, 324.
Polygonum, 67, 322, 329, 416, 443, 586.
Polypodium, 198, 330, 334, 416, 417, 577, 637.
Polyporus, 19, 49, 587.
Polypremum, 420.
Polysaccum, 584, 588.
Polystichum, 324, 422, 638.
Pontederia, 423, 424.
Populus, 416, 447, 584.
Poronia, 586.
Porteranthus, 323.
Porterella, 270.
Portulaca, 329, 421, 586.
Potamogeton, 293, 322, 415.
Potentilla, 32, 33, 60, 65, 265–267, 327, 392, 445, 488, 557.
Poterium, 446.
Primula, 389–391.
Priva, 80.
Proserpinaca, 320, 416, 423.
Prosopsis, 88, 582, 584, 585.
Protodermium, 587.
Prunus, 195, 196, 326, 327, 445, 585.
Pseuderanthemum, 77.
Pseudoleskea, 221–236.
Pseudopeziza, 487, 493.
Pseudoplectania, 491.
Pseudotsuga, 293.
Psilocybe, 582, 586.
Psoralea, 326, 419, 422, 429.
Ptelea, 323.
Pteridium, 409.
Pteris, 328, 419, 424.
Pteropetalon, 213.
Ptilimnium, 419.
Ptychodium, 229.
Puccinia, 60–63, 572, 582, 585.
Pylaisea, 649.
Pyrenopeziza, 60, 487, 493.
Pyrola, 66.
Pyrronema, 480, 491, 614, 622–627.
Pyrularia, 325, 333.
Pyrus, 323, 418, 445.

QUERCUS, 52, 122, 323, 325, 326, 416, 419, 422, 431, 439, 444, 583, 584.
Quinchemalium, 137.

RAMULARIA, 64, 576, 577.
Ranunculus, 66, 261 276, 322–324, 326, 329, 331.
Ribes, 54.
Richardsonia, 421, 434.
Rhabdospora, 55.
Rhamnus, 325.
Rhexia, 418, 423, 424.
Rhododendron, 40.
Rhus, 41, 55, 59, 284, 326, 327, 417, 420, 440, 586.
Rhynchosia, 327, 420.
Rhynchospora, 330, 416, 418, 423, 426, 563.
Rhytiglossa, 78.
Robinia, 335.
Rosa, 88, 329, 335, 417.
Rotala, 418.
Rottboellia, 423, 425.
Rubus, 327, 329, 419, 421.
Rudbeckia, 420, 423, 424, 435.
Ruellia, 74, 75, 326, 422, 585.
Rumex, 128, 329, 419, 427.
Rutstroemia, 492.
Russula, 587.
Ryparobius, 492.

SABAL, 120, 416, 431.
Sabbatia, 330, 405, 418, 419, 423, 424, 432, 433.
Sabina, 582, 584, 585.
Saccobolus, 492.
Sagittaria, 322, 405, 416.
Salicornia, 128.

Salix, 67, 247–257, 293, 294, 323, 354, 399–401, 447, 575, 586.
Salvia, 84, 124, 326, 327, 420.
Sambucus, 324, 417, 439, 445.
Sanchesia, 75.
Sanguinaria, 325.
Sanicula, 326.
Sarcobatus, 293.
Sarcogoum, 128, 129.
Sarcoscypha, 476, 477, 478, 491, 495.
Sarcosphaera, 479, 492, 583, 587.
Sarothra, 328, 420.
Sarracenia, 330, 418, 423, 428, 432, 560.
Sassafras, 327, 419.
Saururus, 365–372, 416.
Saxifraga, 66, 214, 328, 388, 389, 393, 443.
Scandix, 338.
Schizandra, 444.
Schizaea, 40, 90, 563.
Schizanthus, 23.
Schizophyllum, 587.
Schizostoma, 52.
Scirpus, 322, 323, 331, 416, 418, 419, 426.
Scleria, 419.
Scleroderma, 588.
Sclerolepsis, 423.
Sclerotinia, 481, 492, 495.
Scoparia, 25.
Scrophularia, 557.
Scutellaria, 326, 327, 339, 443.
Sebastina, 417, 430.
Sedum, 444.
Seemania, 27.
Selaginella, 322, 324, 641.
Senecio, 169, 189, 271, 272, 276, 328, 341.
Septoria, 57, 574.
Sericocarpus, 326, 420.
Sesbania, 429.
Sessea, 22.
Setaria, 85, 86.
Shepherdia, 293.
Sibthorpia, 25.
Sida, 87, 421, 422, 430.
Sidalcea, 64.
Sideranthus, 620–621.
Sideritis, 84.
Siegesbeckia, 446.
Silene, 65, 325–327.
Silphium, 328, 420.
Simblum, 583, 587.
Siparuna, 133.
Sisymbrium, 329, 342.
Sisyrinchium, 231–246, 326, 333, 373–375, 380, 383, 556.
Sitilias, 421.
Smilacina, 58, 357, 358, 577.
Smilax, 323–325, 327, 417, 572, 573, 575, 585.
Solanum, 37, 39, 292, 329, 421.
Solidago, 41, 425, 326, 341, 418, 422, 572, 578, 599, 614, 651.
Sordaria, 407, 586.
Sorghum, 586.
Sparganium, 322, 416.
Spartina, 293.
Sphacele, 84.
Sphaeralcea, 88.
Sphaerella, 139.
Sphaeria, 463.
Sphaerobolus, 586, 587.
Sphaerospora, 479, 492.
Sphaeropsis, 55, 573.
Sphaerotheca, 441, 442, 445, 446.
Sphagnum, 205, 211, 369.
Spiraea, 445, 446, 575.
Sporobolus, 421.
Spraguea, 294.
Stachys, 84, 124, 443.
Stagonospora, 56.
Stammaria, 493.
Stellaria, 65.
Stemonacanthus, 74.
Stemonitis, 587.
Stemodia, 24.
Stemphylium, 285, 286.
Stenanthella, 530, 531.
Stenanthium, 531.
Stenhammaria, 66.
Stenocybe, 643.
Stenophragma, 329.
Stenophyllus, 421.
Stenotopsis, 617.
Stenotus, 614–618.
Stephanomeria, 349.
Stereum, 20.
Sterigmatocystis, 284.
Stillingia, 420, 423, 429.
Stipa, 325.
Stochytarpheta, 80.
Stropharia, 16, 582, 586.
Struthanthus, 135.
Stylosanthes, 326, 336, 422.
Styrax, 323, 339, 417, 440, 444.
Syringa, 444.
Symplocos, 323.
Syndesmon, 325.
Syntherisma, 421.
Synthyris, 61.

TAFALLAEA, 133.
Tandonia, 128.
Tapesia, 484, 487, 493, 495.
Taraxacum, 67, 329.
Taxodium, 416, 423, 425.
Tecoma, 75, 417.
Teichospora, 52.
Tetradymia, 52, 292.
Tetragonotheca, 420.
Tetraneuris, 62.
Thalesia, 325, 340.
Thelesperma, 630–632.
Thalictrum, 27, 323, 331, 443.

Thermopsis, 275, 577.
Thlaspi, 265.
Thrinax, 140.
Thuidium, 649.
Thyridium, 53.
Tiarella, 324.
Tilia, 323, 438, 440, 447.
Tillandsia, 42, 43, 283, 416, 417.
Tipularia, 324, 333, 422, 427.
Tremella, 51.
Triadenum, 330, 410, 416.
Trichobelonium, 485, 493.
Tricholoma, 611.
Trichomanes, 199.
Trichostema, 326, 420.
Trichostomum, 648.
Trifolium, 293, 294, 326–329, 585.
Triglochin, 293.
Trilista, 423, 424.
Trillium, 324.
Triplaris, 129, 130.
Trisetum, 67.
Trochopteris, 90.
Tropaeolum, 409.
Troximon, 576.
Tofieldia, 67, 418, 423, 528.
Torreya, 562, 564.
Townsendia, 394.
Tylostoma, 587.
Typha, 322, 573, 599.
Typhula, 649.

ULMUS, 323, 417, 446, 584.
Ulocolla, 587.
Uniola, 122, 437, 438, 440, 442, 446.
Uredo, 63, 586.
Urnula, 584, 589.
Urocystis, 572.
Uromyces, 62, 89, 289, 290, 585, 586.
Usnea, 559.
Ustilago, 62, 586.
Utricularia, 27, 330, 415, 416, 423, 434.
Uvifera, 129.
Uvularia, 323, 324, 332.

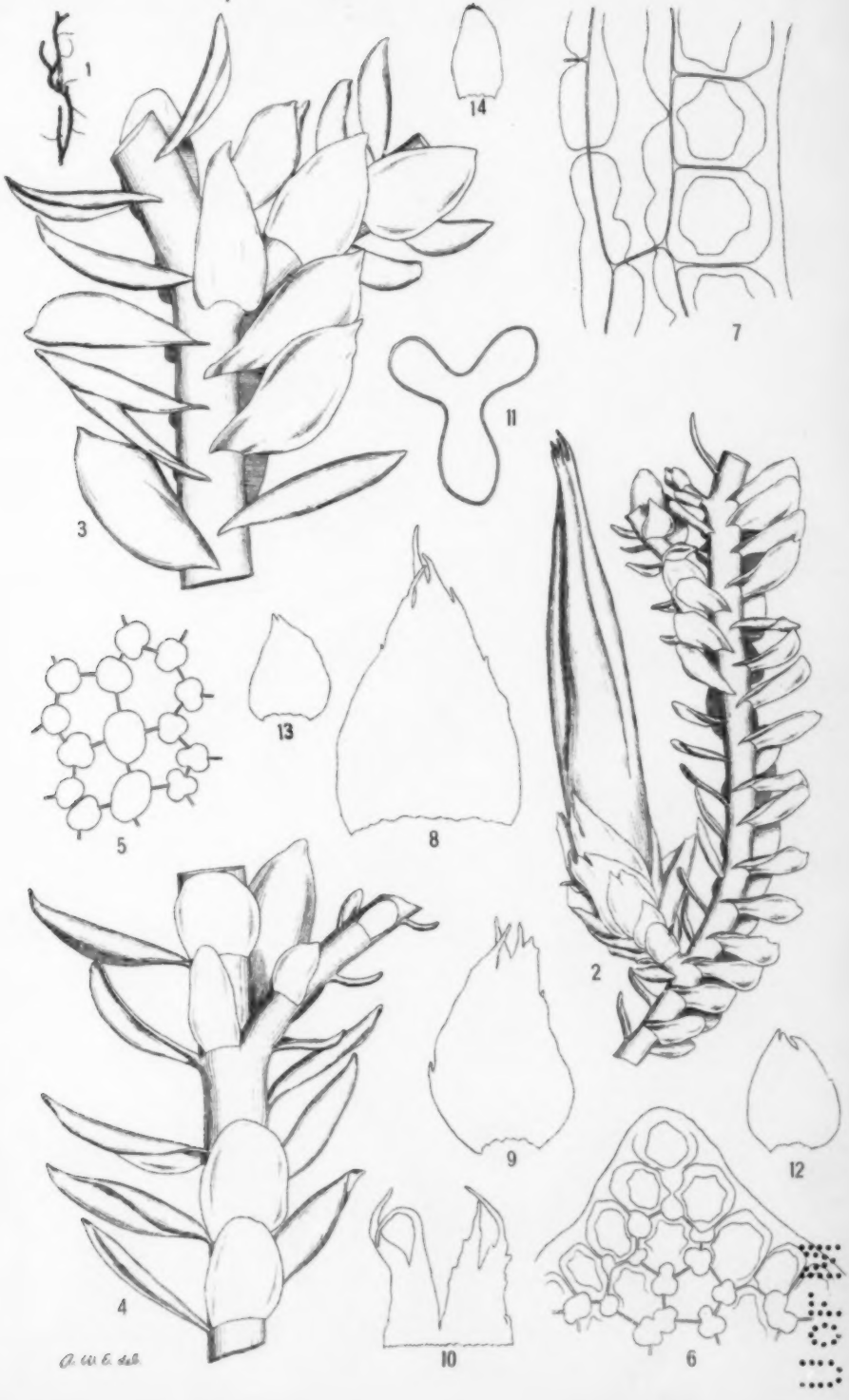
VACCINIUM, 66, 323, 326, 328, 420, 424.
Vagnera, 324.
Valerianella, 184, 328, 334.
Valerianodes, 80.
Vandellia, 25.
Veratrum, 531, 650.
Verbascum, 329.
Verbena, 80, 88, 327, 329, 420, 421, 585.
Verbesina, 327.
Vernonia, 322, 418, 420, 585, 586.
Veronica, 25, 66, 279, 280, 322, 329.
Vestia, 39.
Viburnum, 325, 326, 340, 417, 422, 435.
Vicia, 326, 329, 336, 444, 453.
Villamilla, 128.
Vincetoxicum, 326.
Viola, 322, 324–326, 336, 337.
Virgularia, 25.
Viscum, 135.
Vitex, 82.
Vitis, 53, 326, 420, 422.
Volkameria, 82.
Volutella, 286.

WALDSTEINIA, 325, 335.
Weisia, 205.
Woodsia, 328, 638, 639.
Woodwardia, 40, 324, 418, 599.

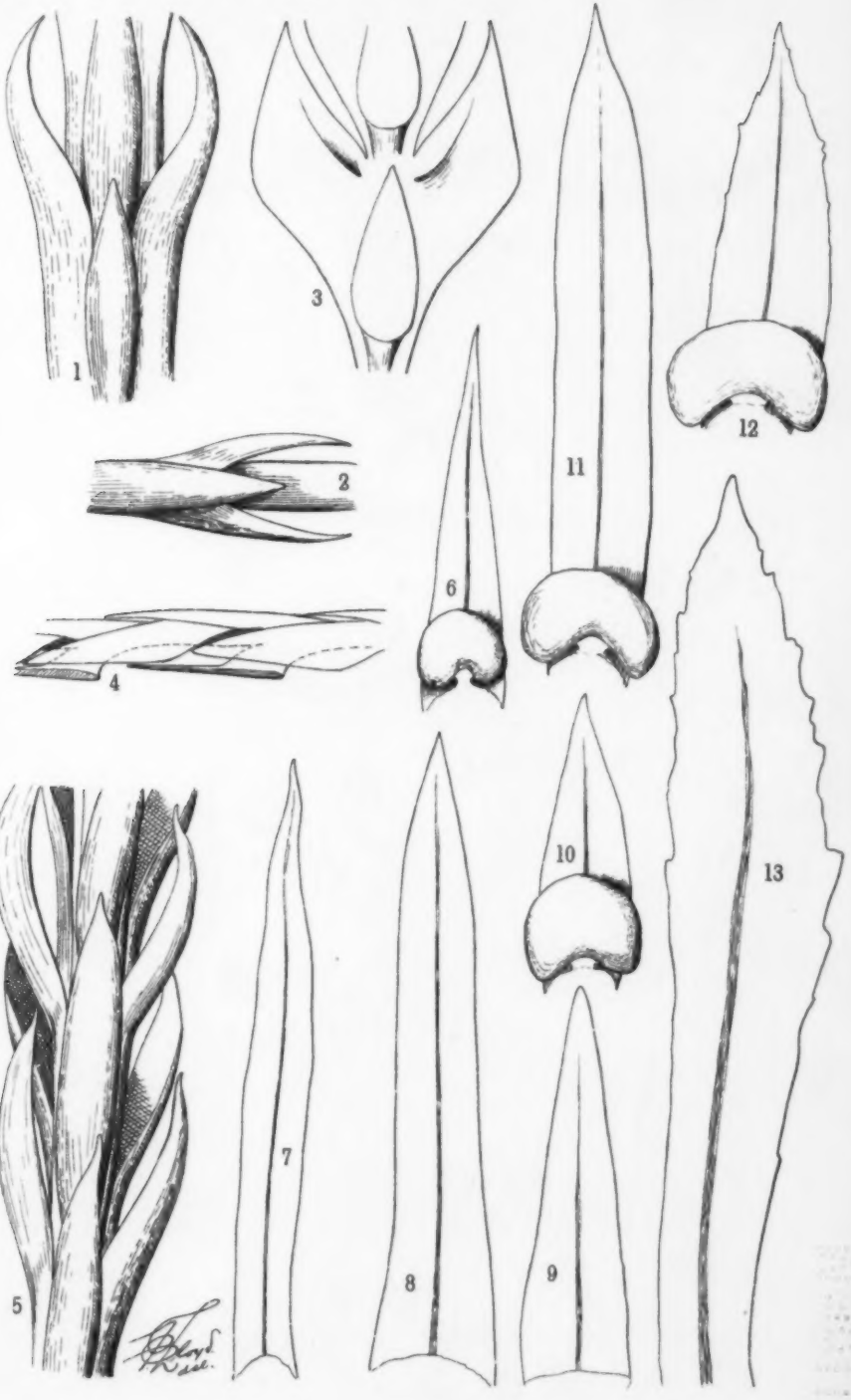
XANTHIUM, 329, 421, 585.
Xanthorrhiza, 324.
Xanthoxylum, 586.
Xerophyllum, 529, 530.
Xerotus, 584, 587.
Xolisma, 324.
Xyris, 330, 419.

YUCCA, 327, 328, 419, 574.

ZEA, 573, 586.
Zelkova, 438, 446.
Zizia, 326.
Zornia, 419.
Zygadenus, 418, 533–538.
Zygodesmus, 50.

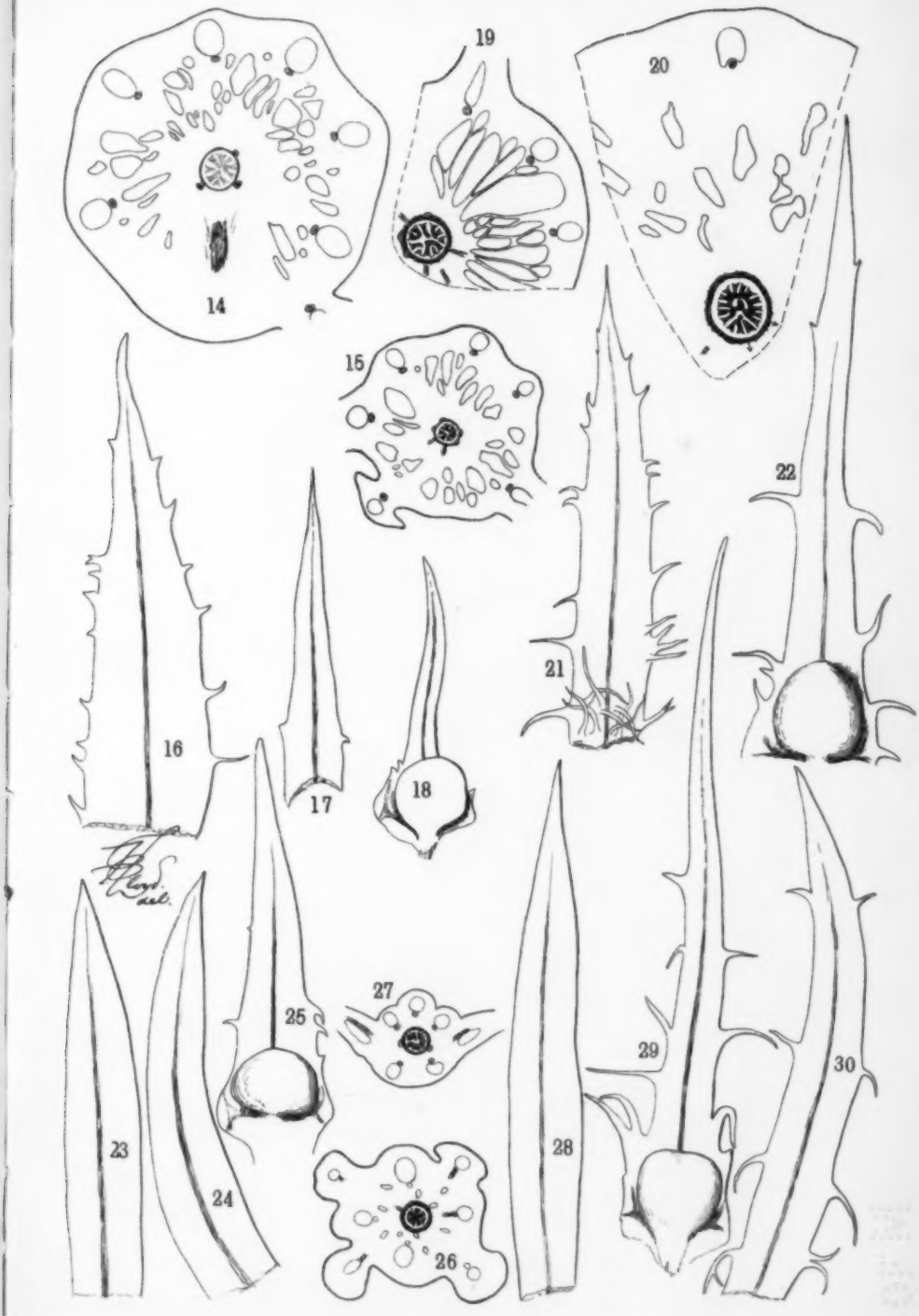


ACROMASTIGUM INTEGRIFOLIUM (Aust.) Evans.

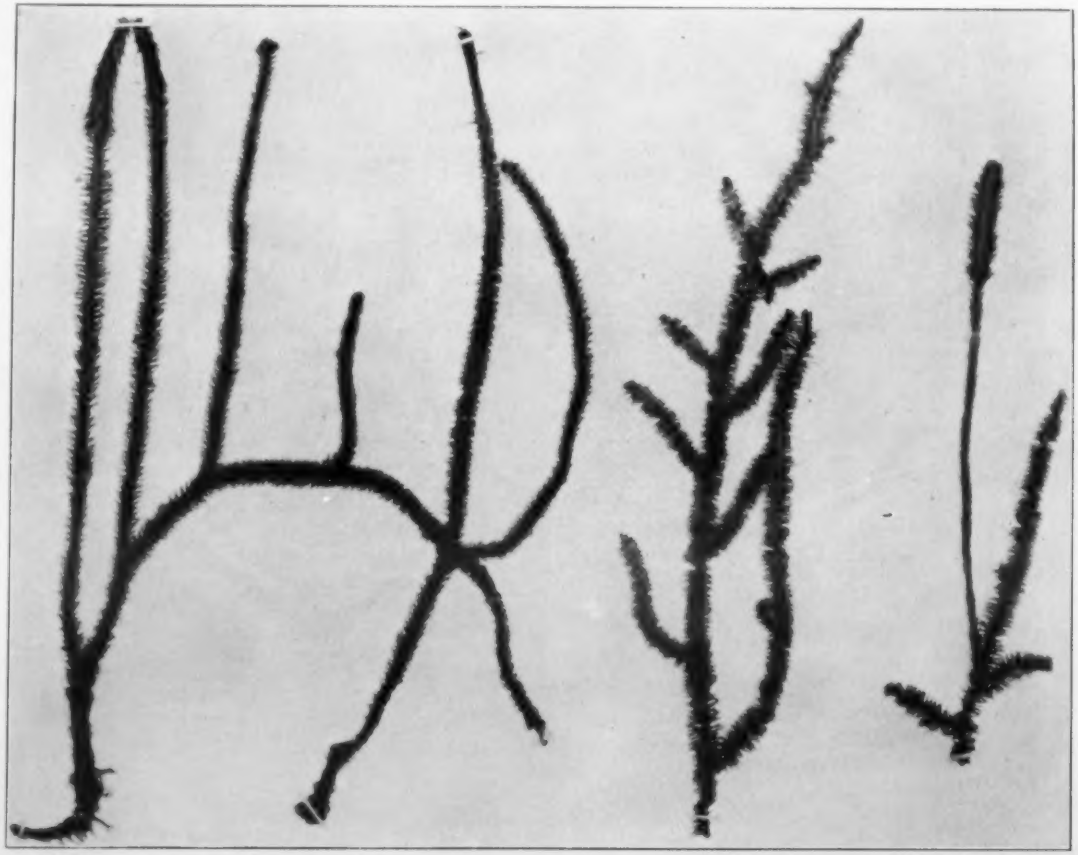


LLOYD AND UNDERWOOD ON LYCOPODIUM.

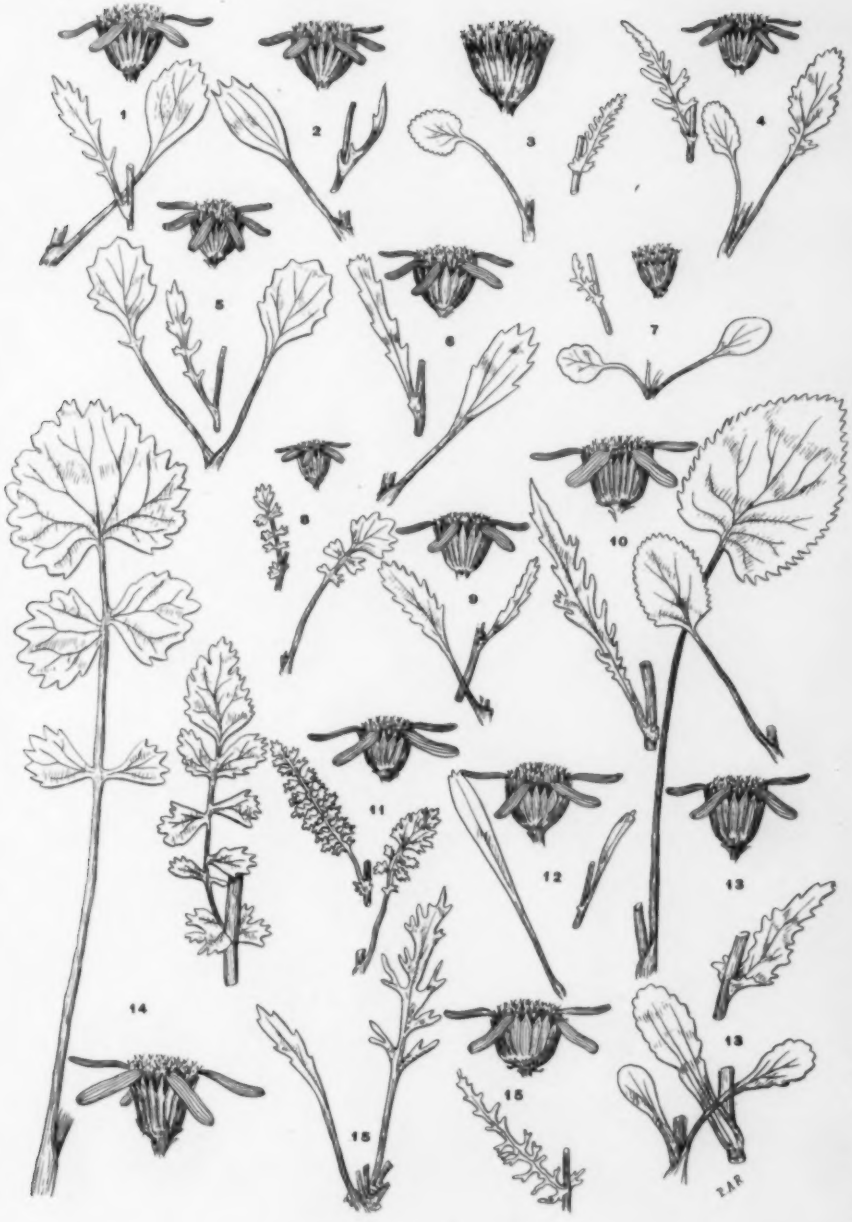
THE HELIOTYPE PRINTING CO., BOSTON.



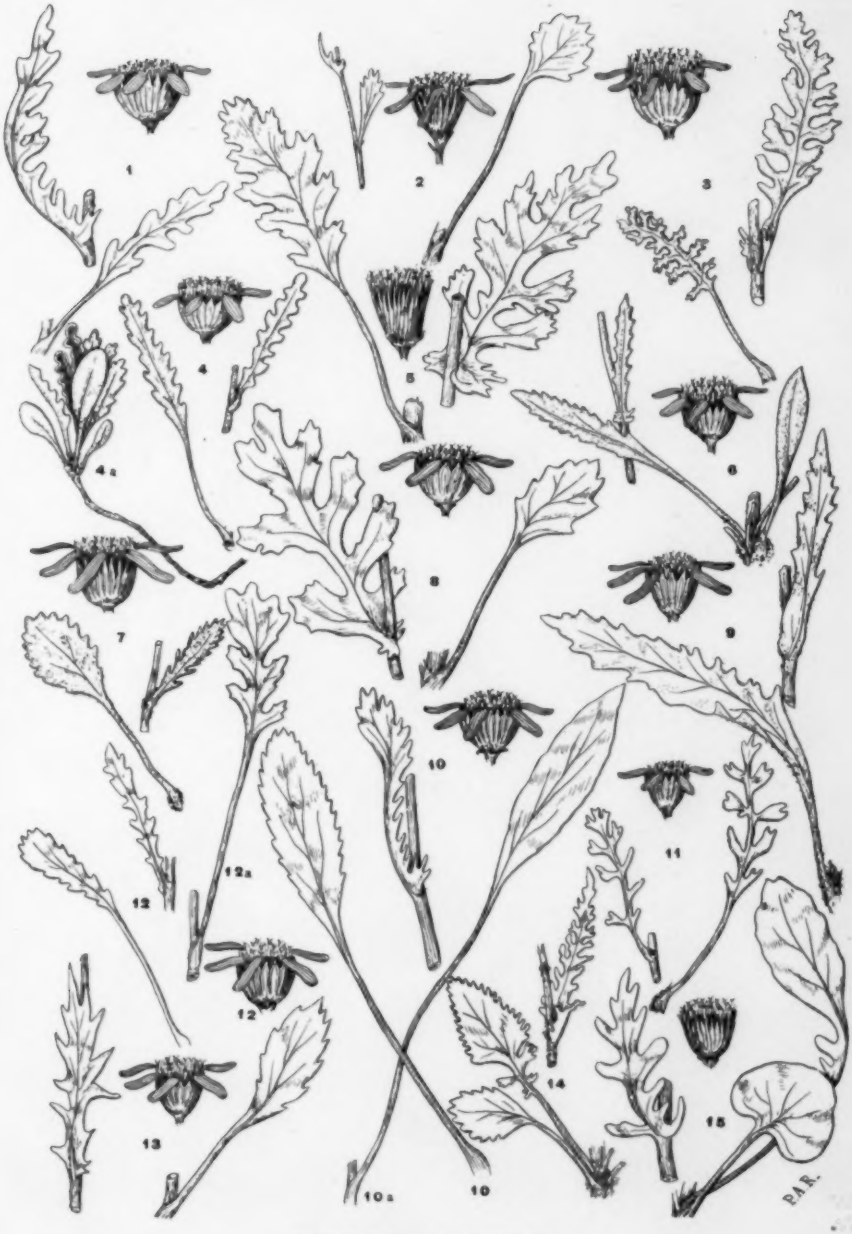
LLOYD AND UNDERWOOD ON LYCOPODIUM.



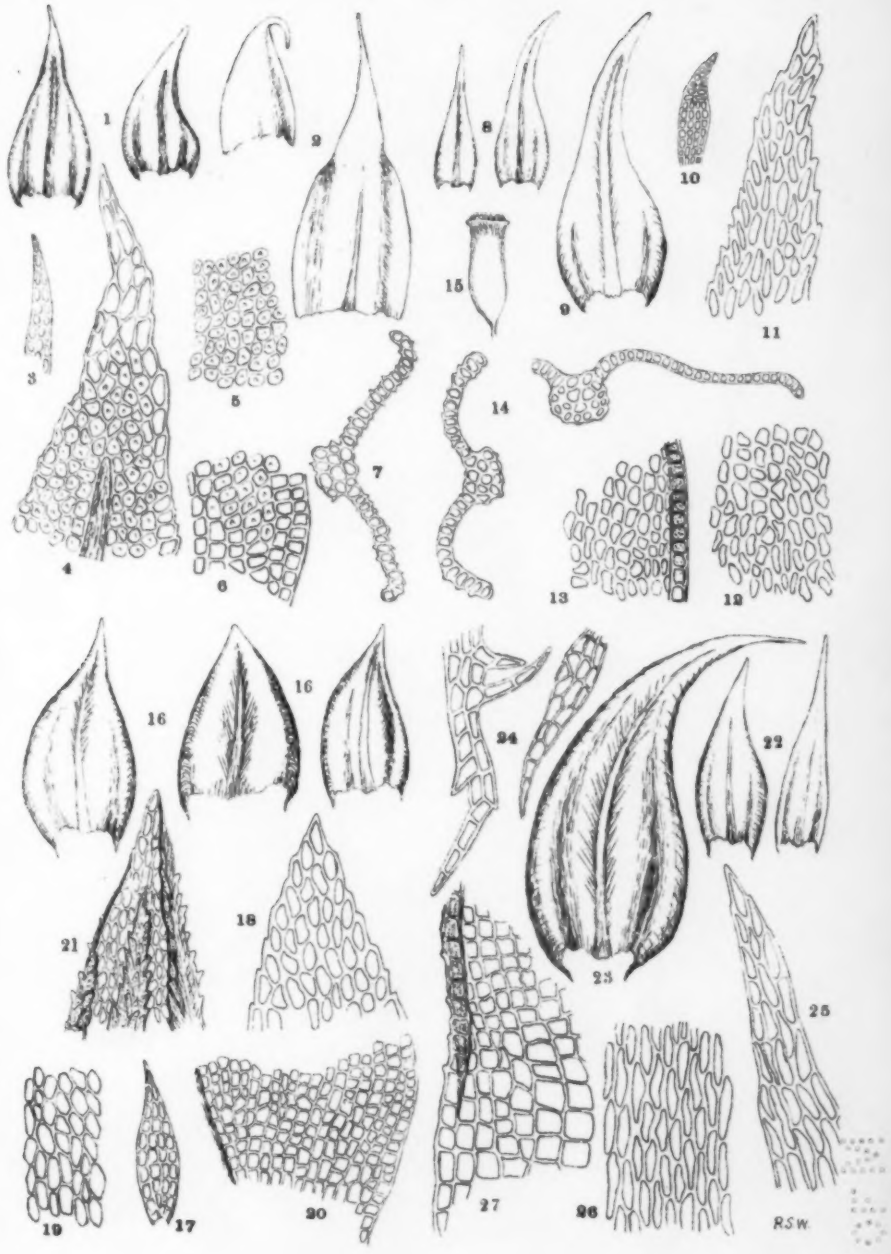
LYCOPODIUM ALOPECUROIDES AND LYCOPODIUM PINNATUM.



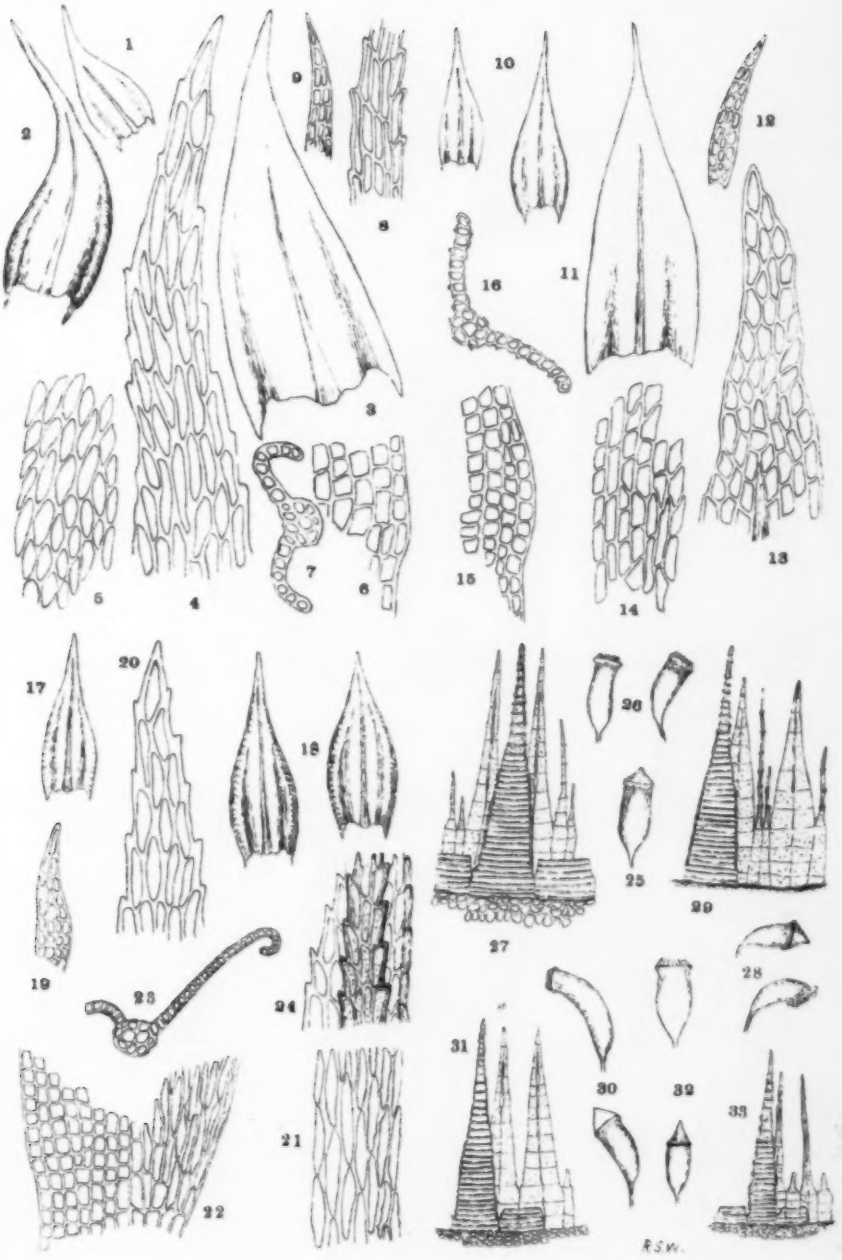
RYDBERG ON SENECIO.



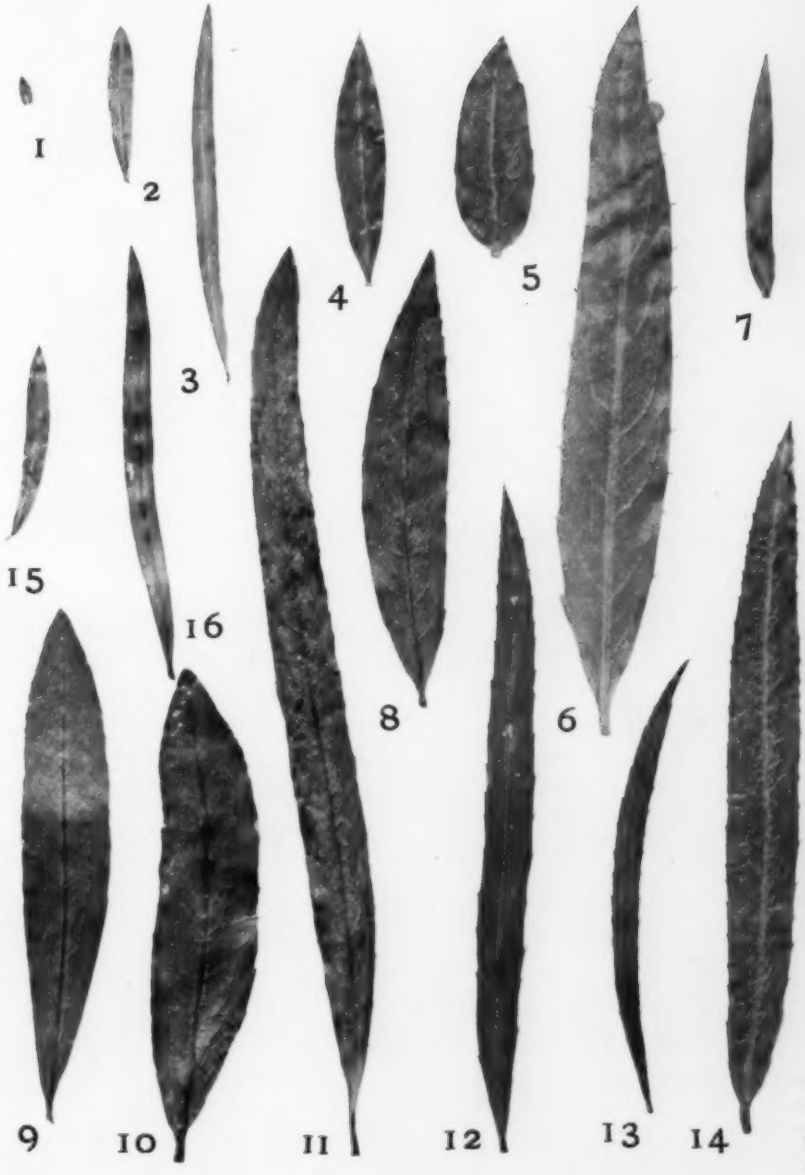
RYDBERG ON SENECIO.



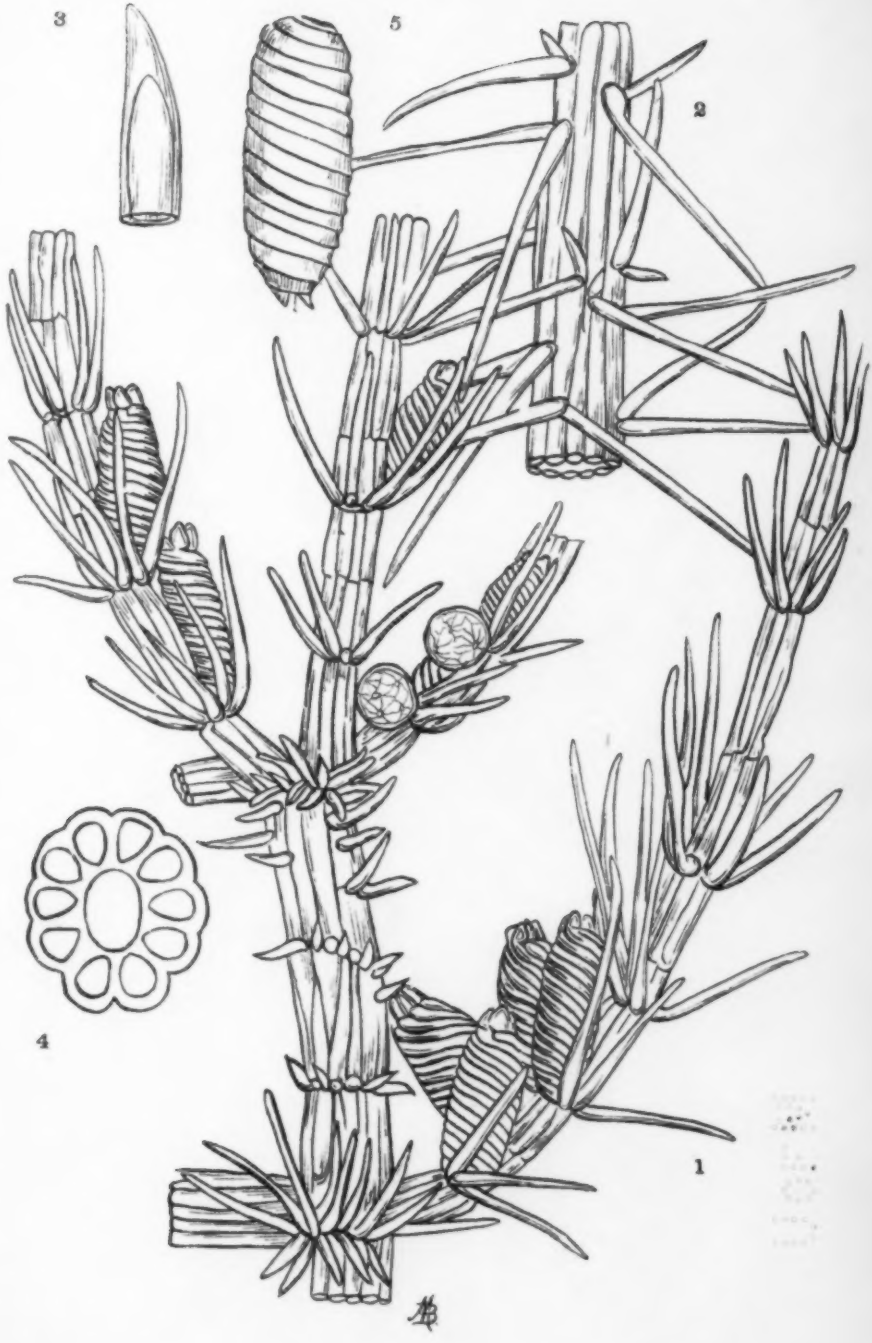
THE HELIOTYPE PRINTING CO. BOSTON



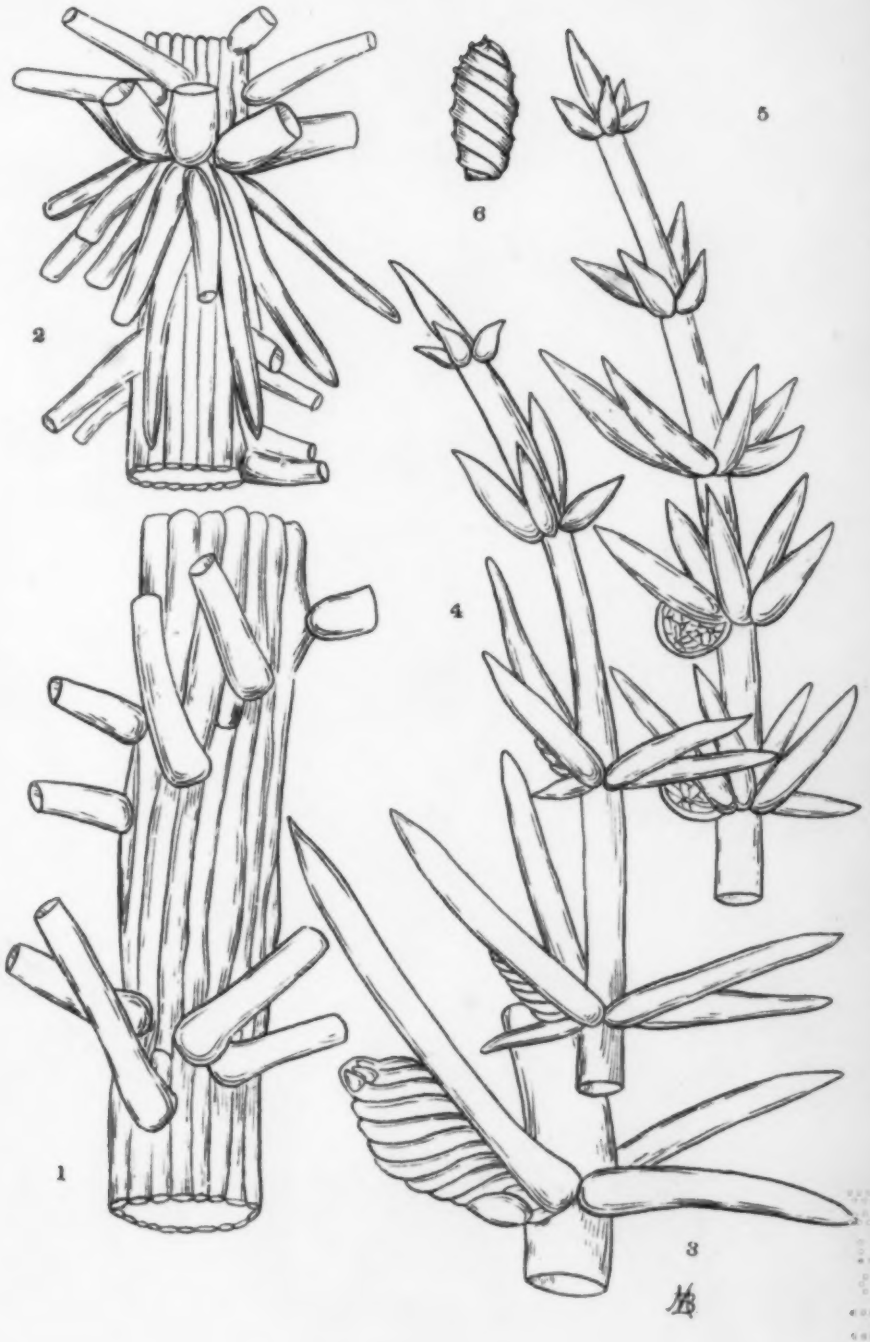
THE HELIOTYPE PRINTING CO. BOSTON


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

THE HELIOTYPE PRINTING CO., BOSTON.



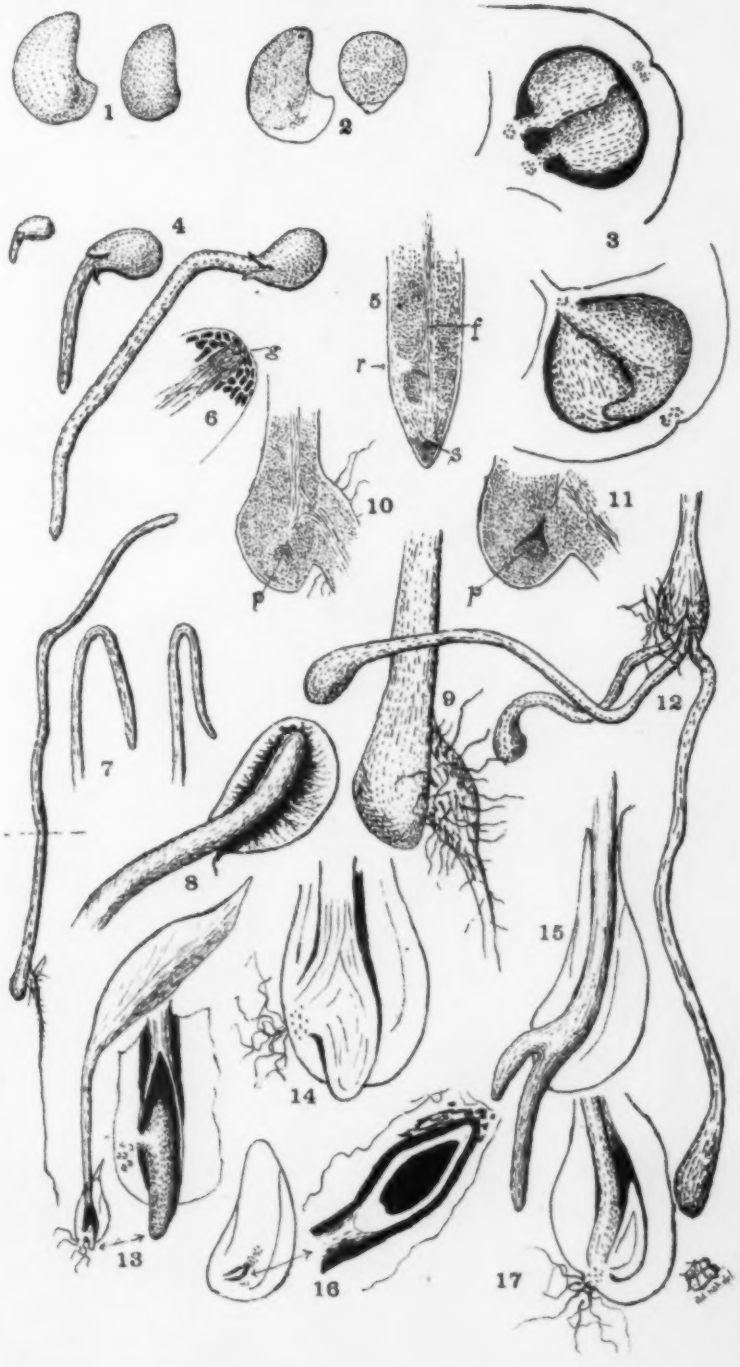
THE HELIOTYPE PRINTING CO., BOSTON.



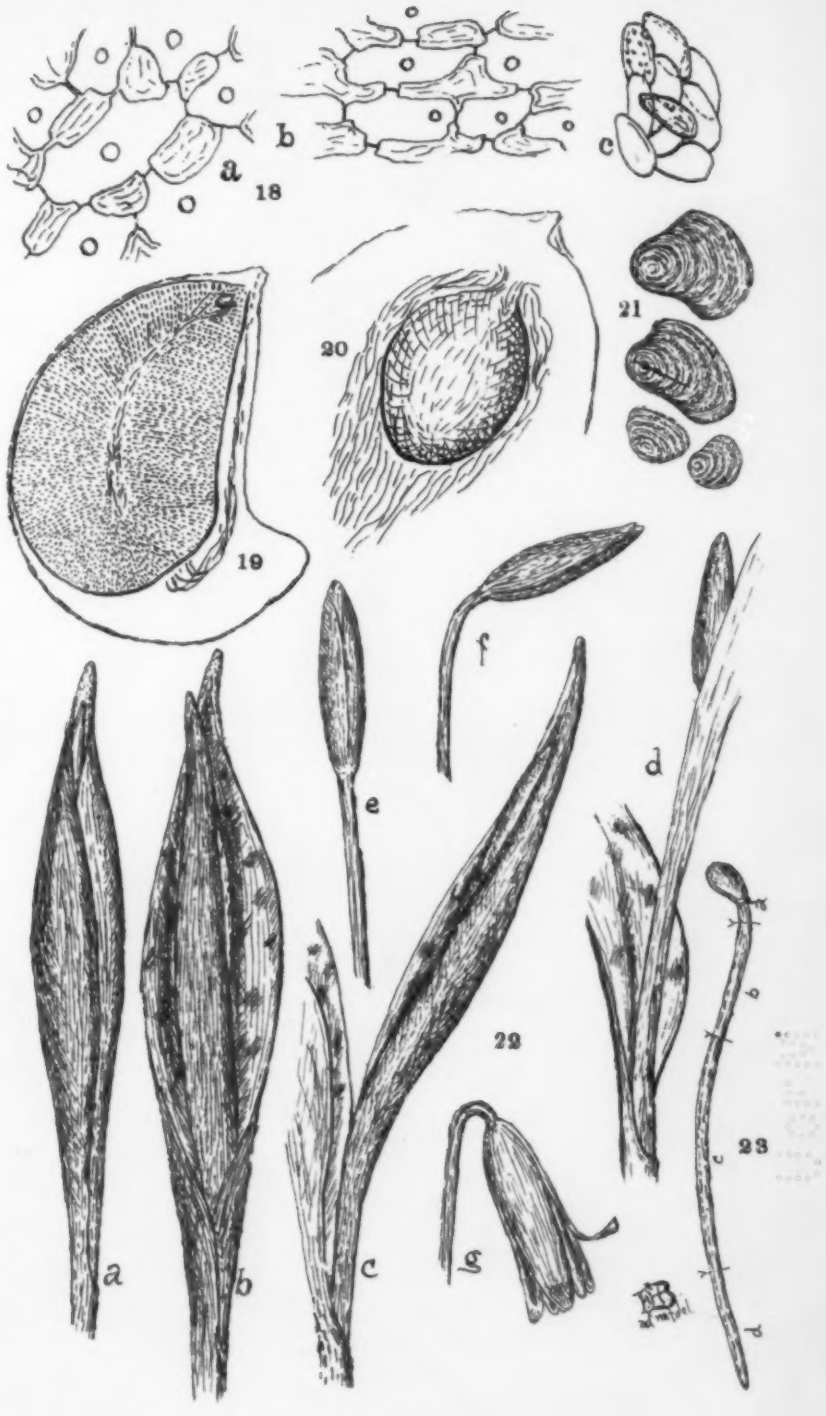
THE HELIOTYPE PRINTING CO., BOSTON.

THE HELIOTYPE PRINTING CO., BOSTON.

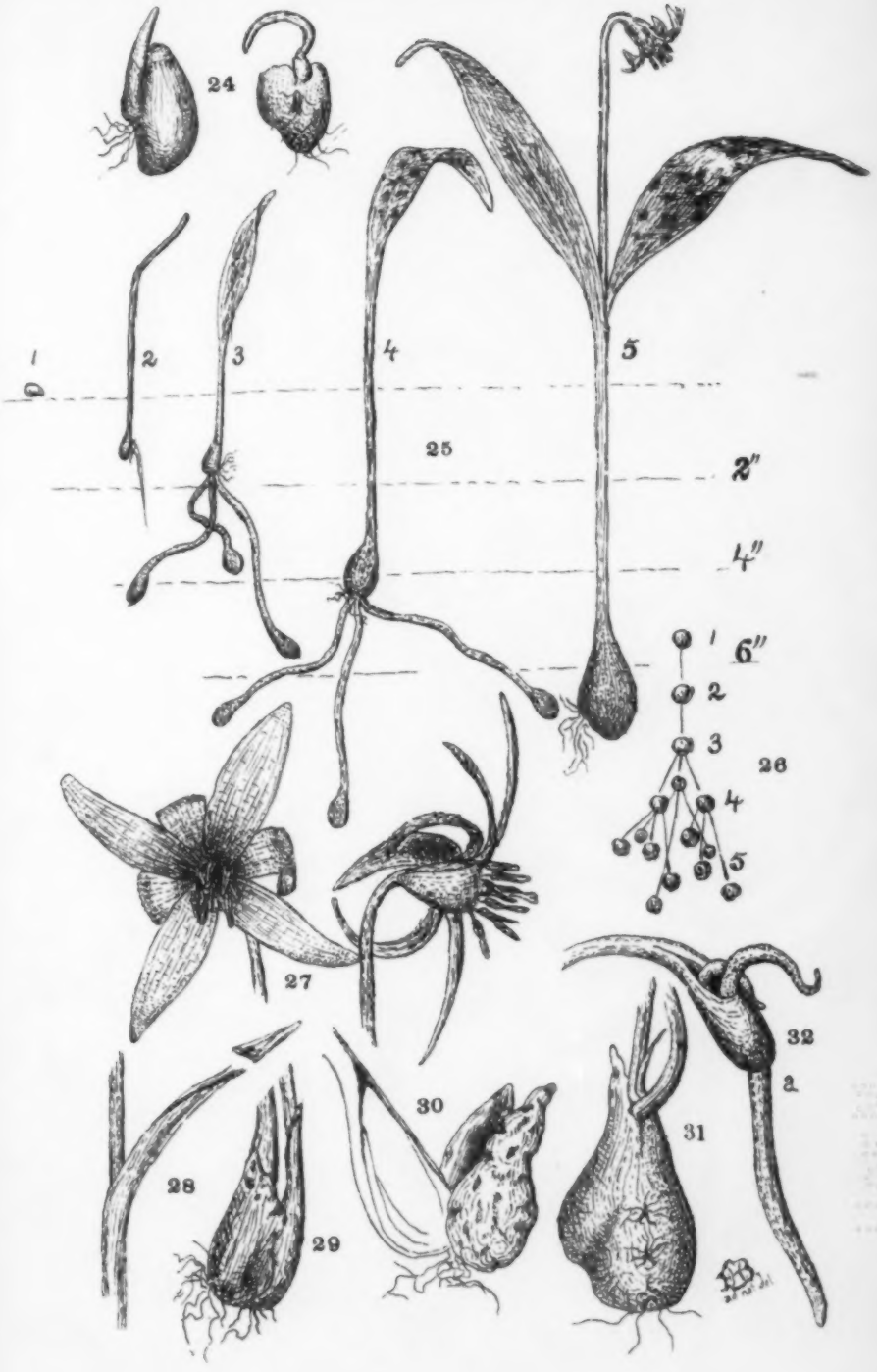
THE HELIOTYPE PRINTING CO., BOSTON.



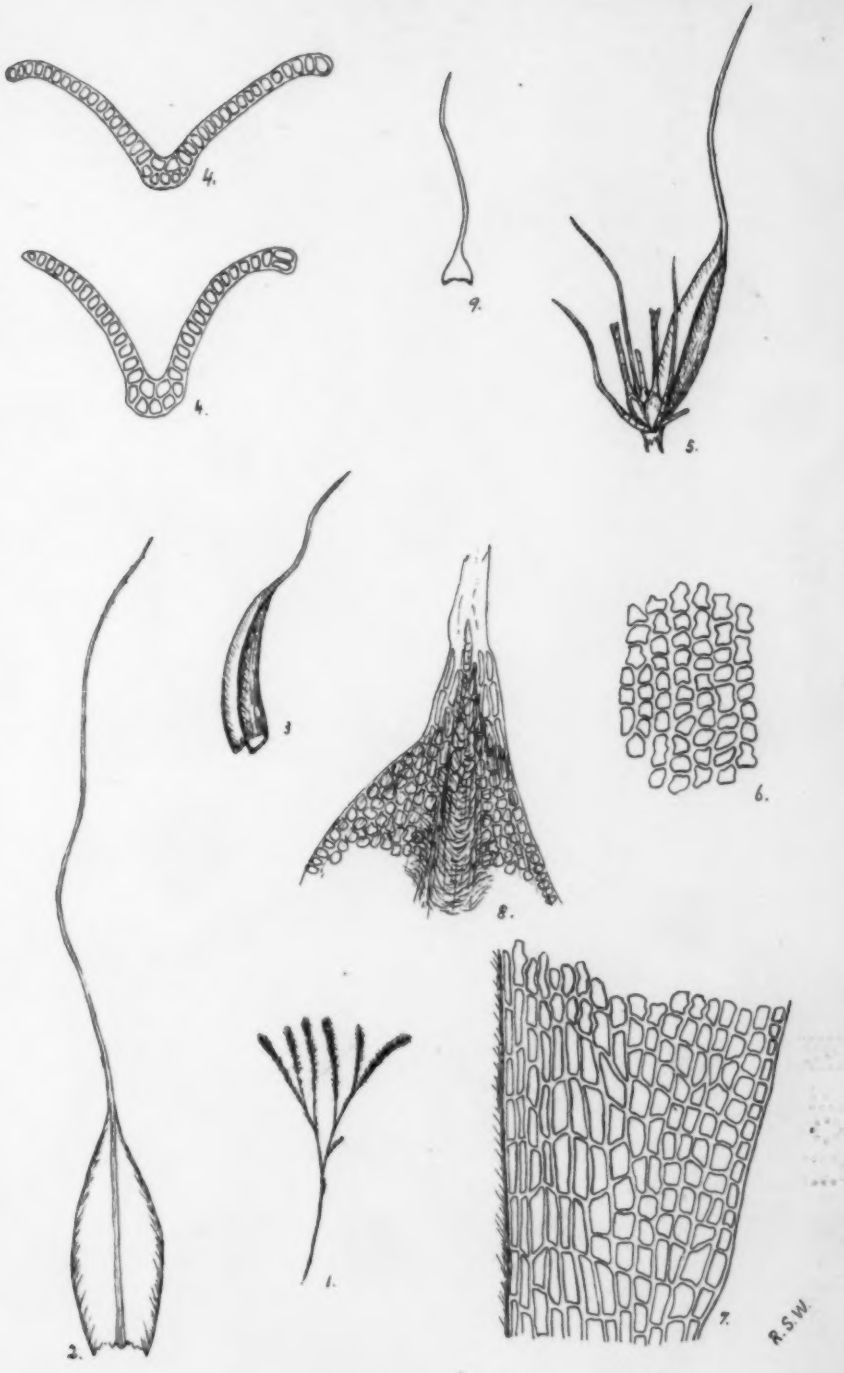
ERYTHRONIUM AMERICANUM.



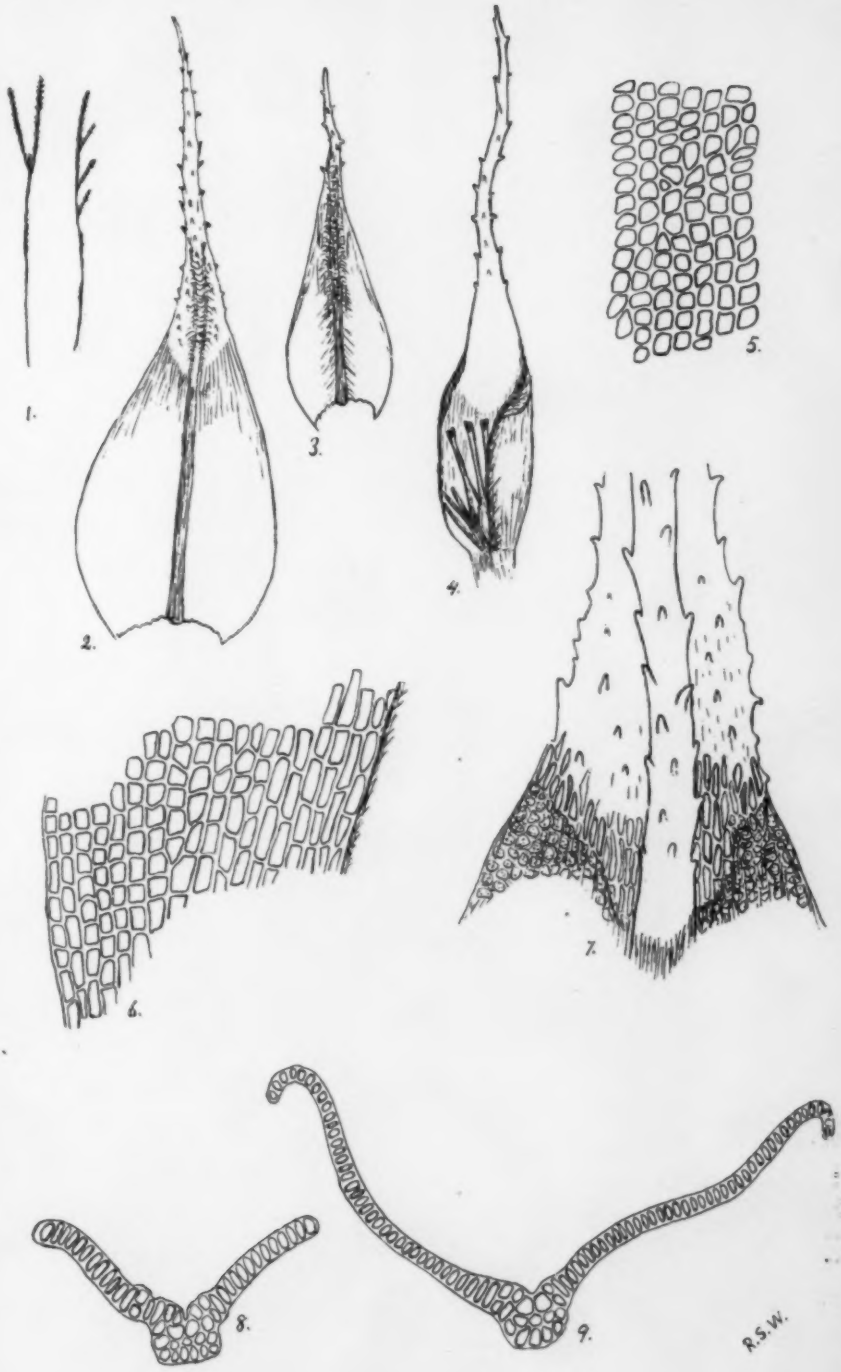
ERYTHRONIUM AMERICANUM.



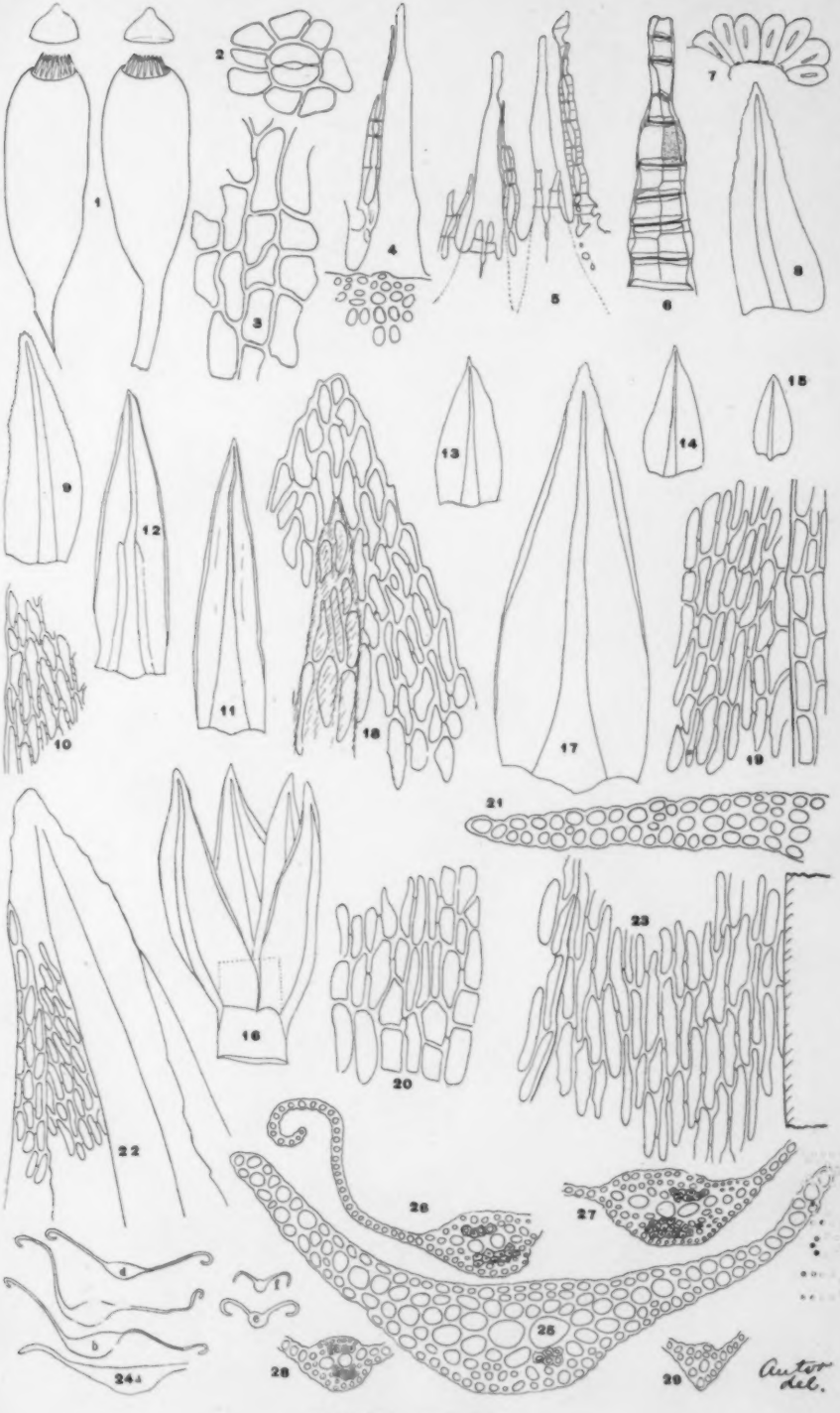
ERYTHRONIUM AMERICANUM.



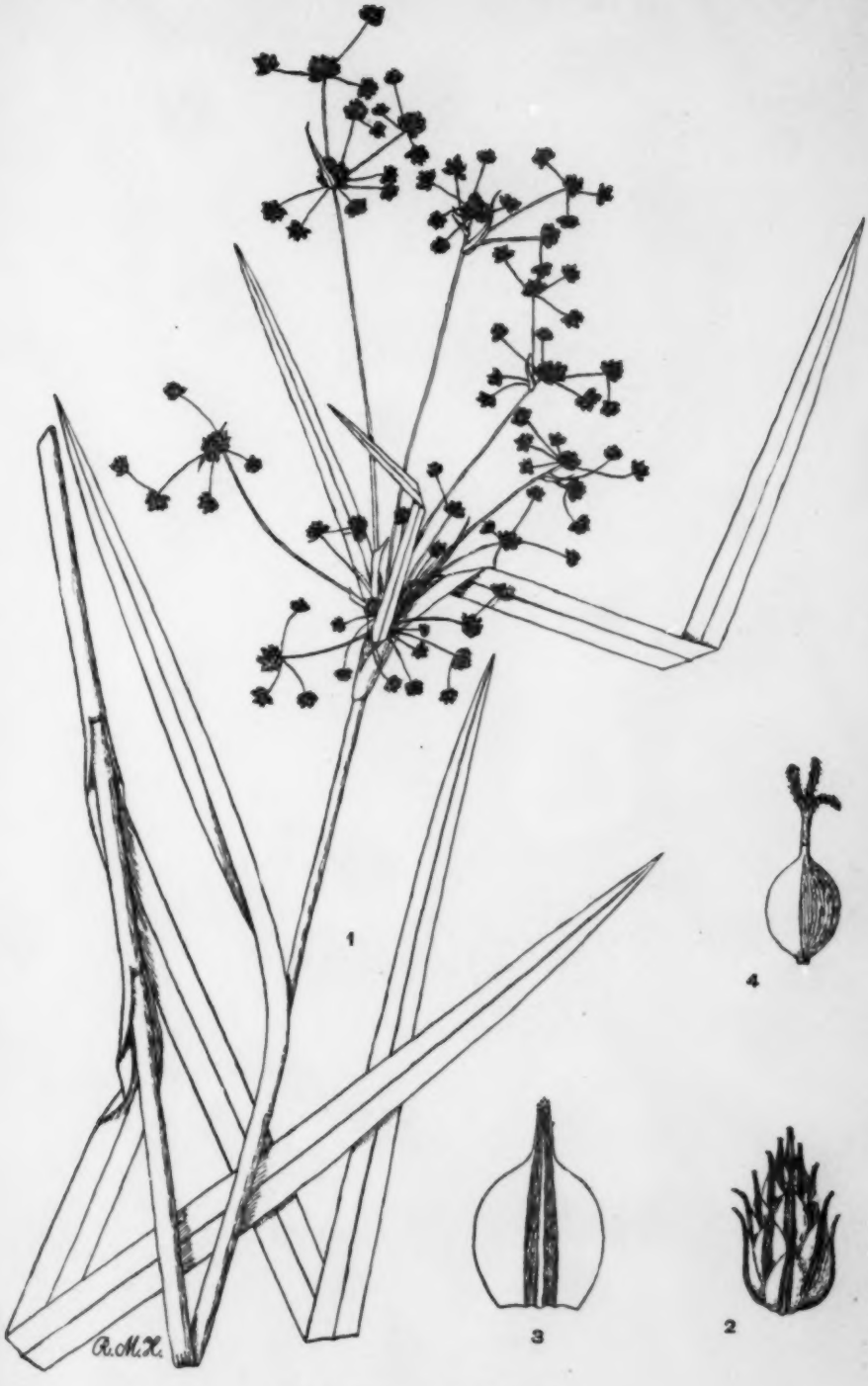
GRIMMIA BRITTONIAE.



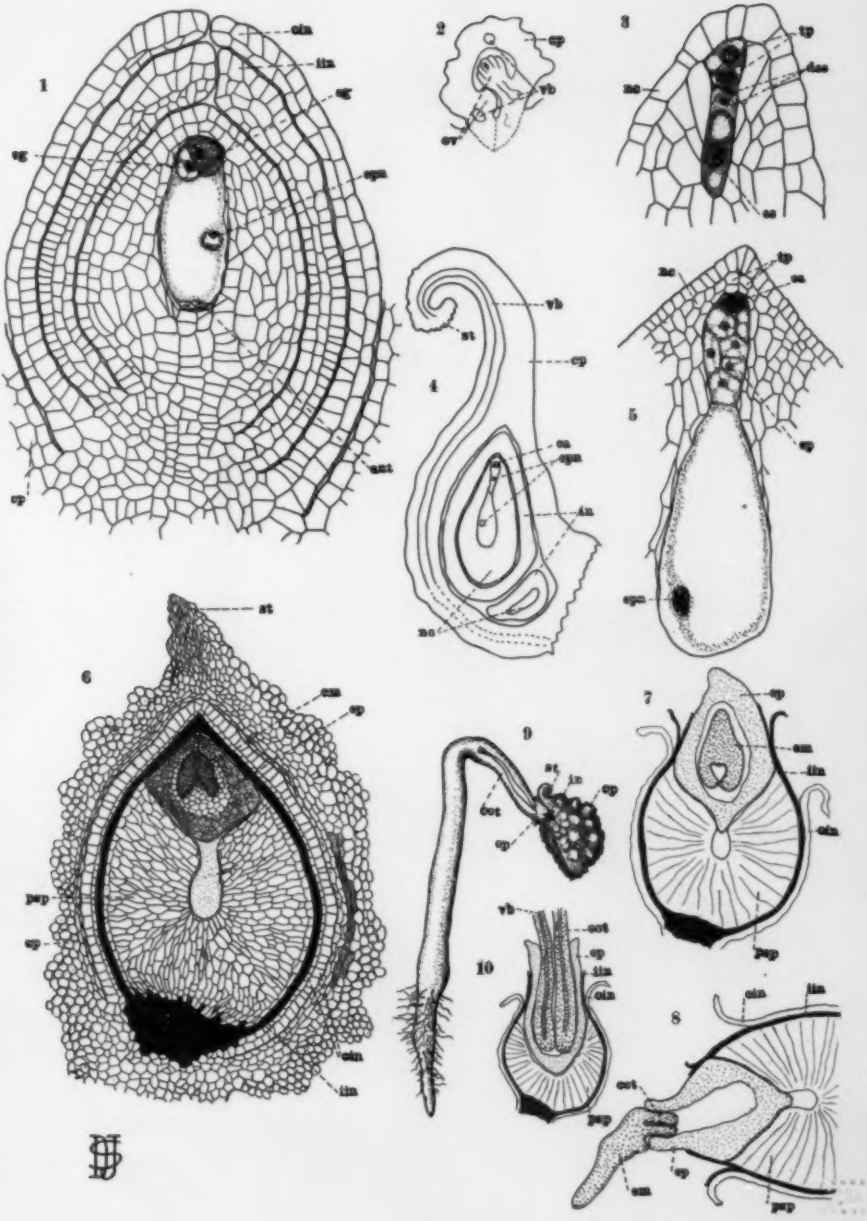
GRIMMIA TENUICAULIS.



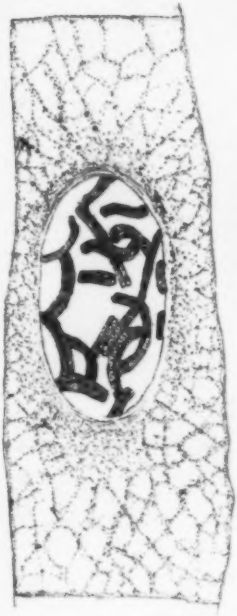
POHLIA POROSA



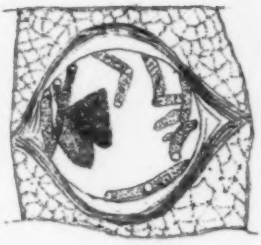
SCIRPUS GEORGIANUS



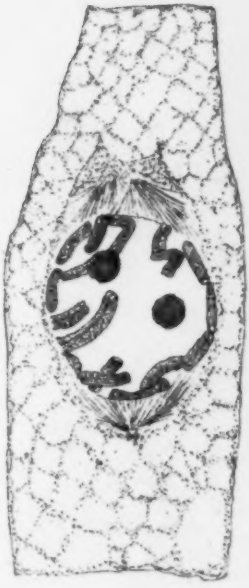
JOHNSON ON SAURURUS.



1

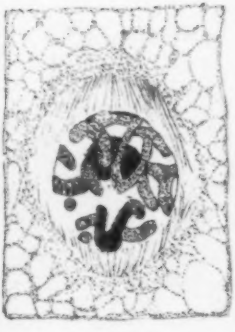


2

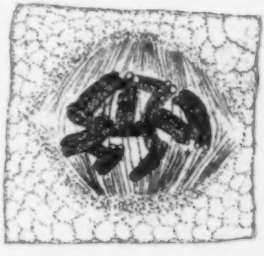


3

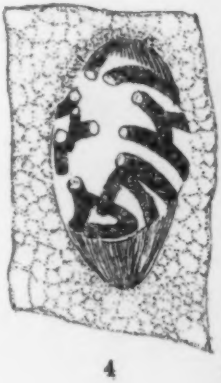
5



6

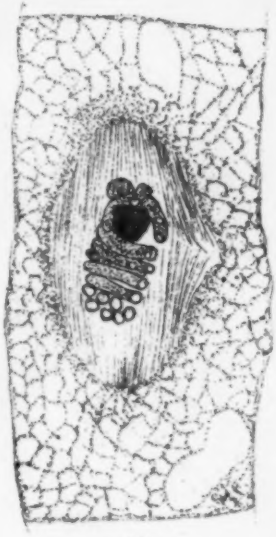


7



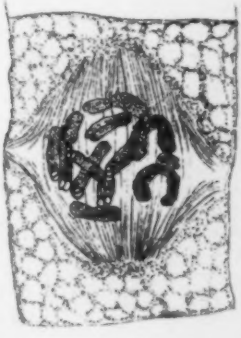
4

THE HELIOTYPE PRINTING CO., BOSTON.

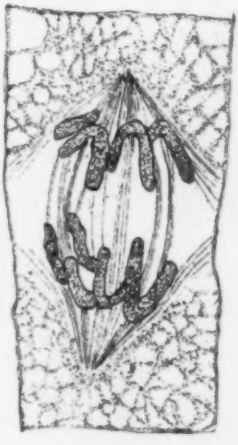


10

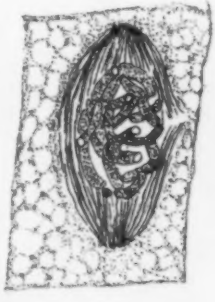
11



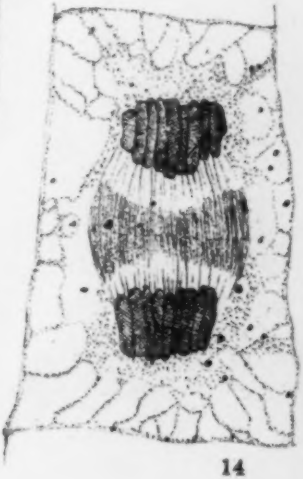
8



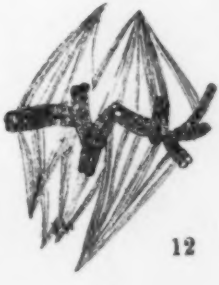
13



9

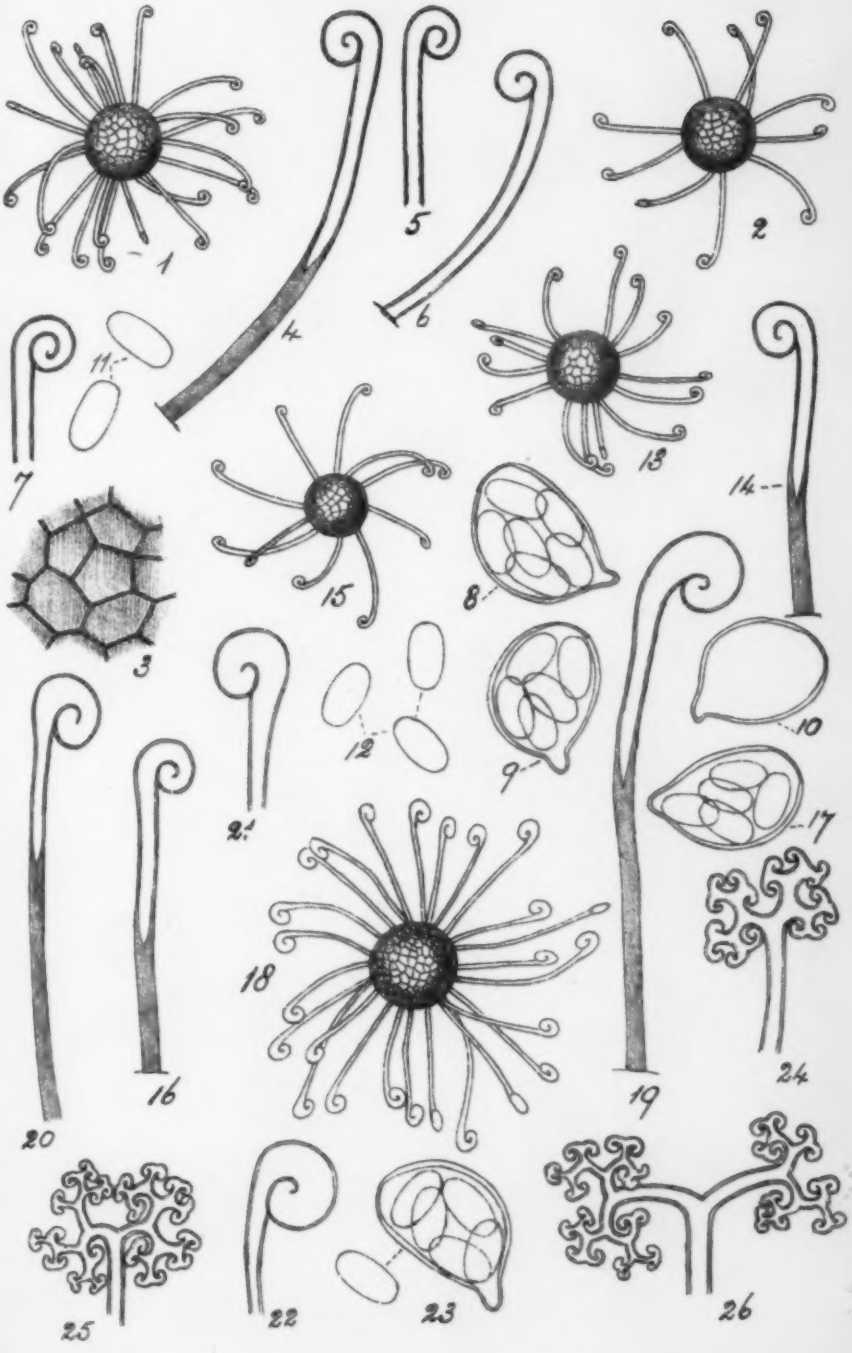


14

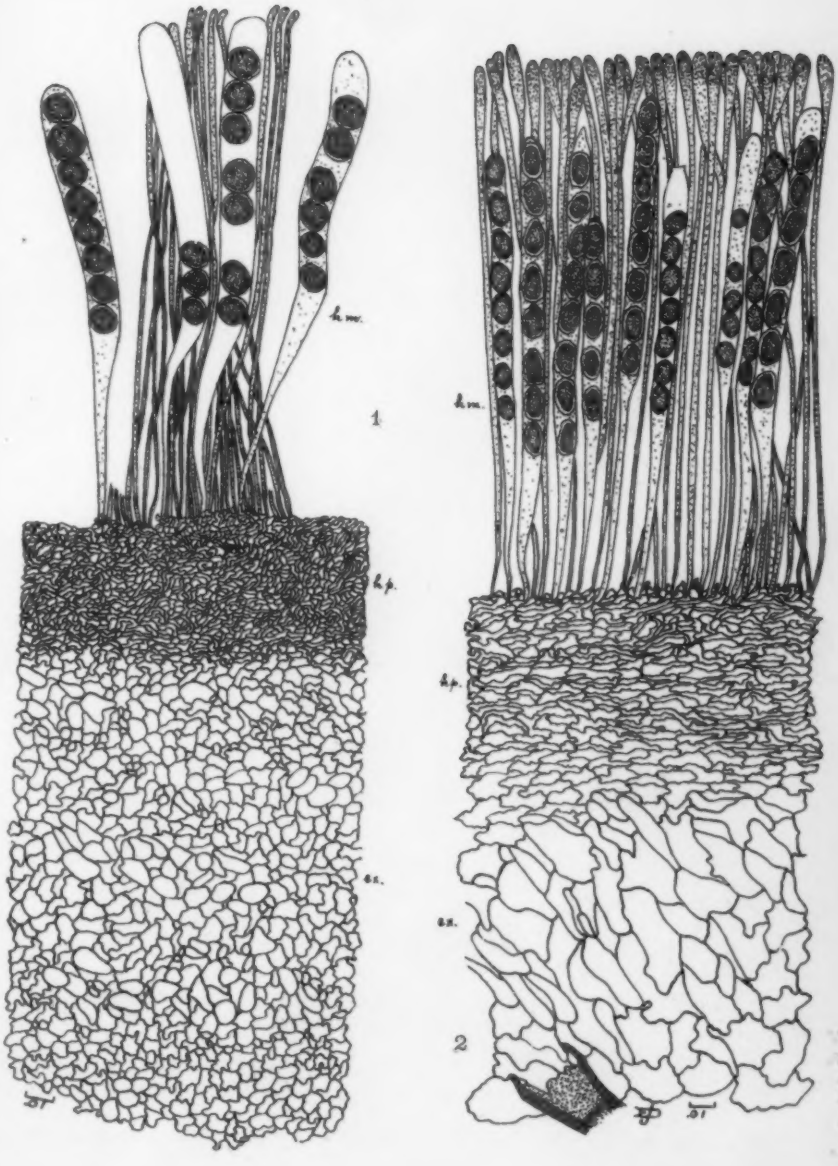


12

THE HELIOTYPE PRINTING CO., BOSTON.

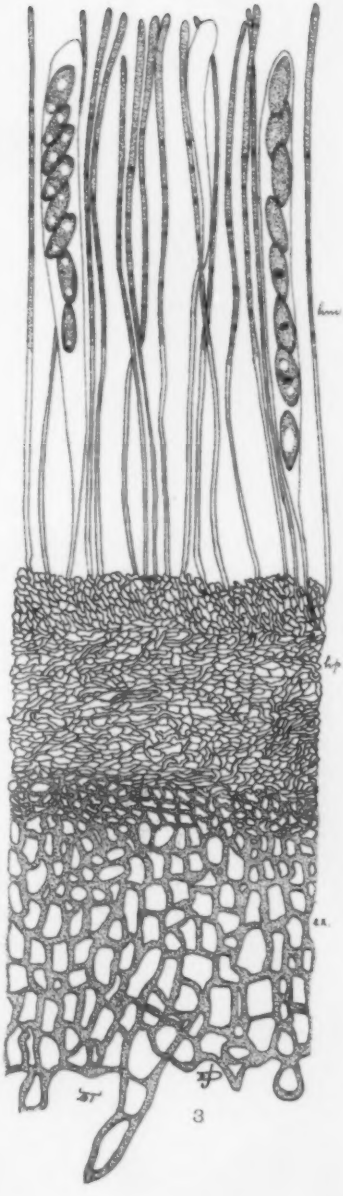


THE HELIOTYPE PRINTING CO., BOSTON.

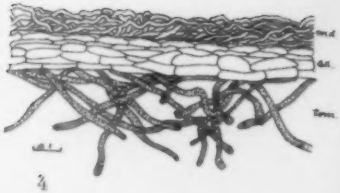


DURAND ON THE PEZIZINEAE.

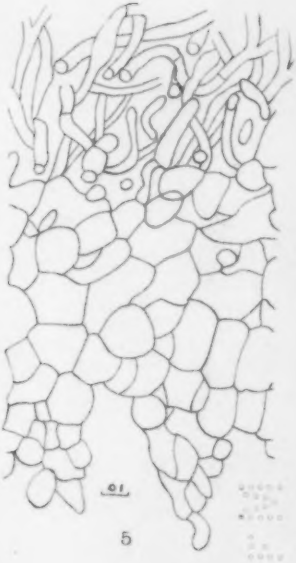
THE HELIOTYPE PRINTING CO., BOSTON.



3



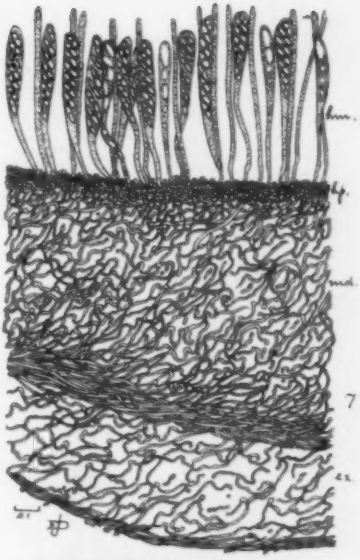
4

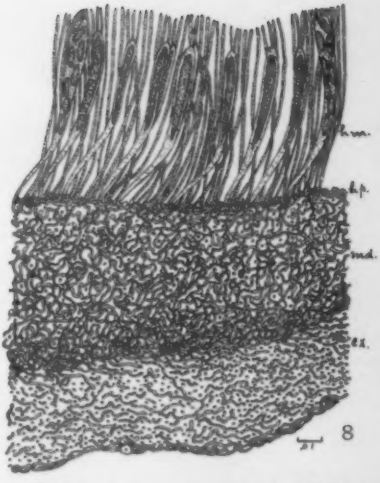


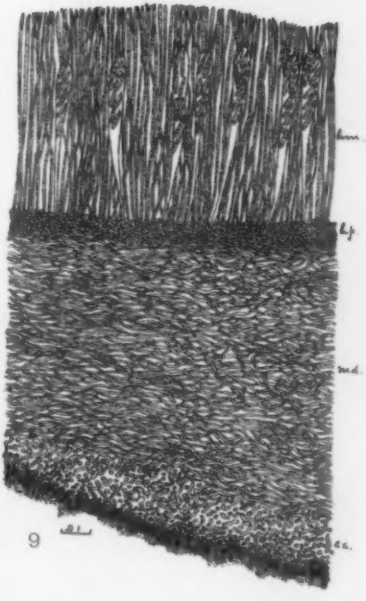
5

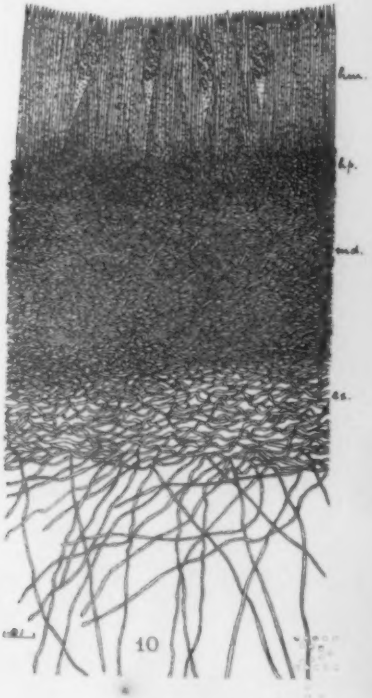
DURAND ON THE PEZIZINEAE.

THE HELIOTYPE PRINTING CO., BOSTON.



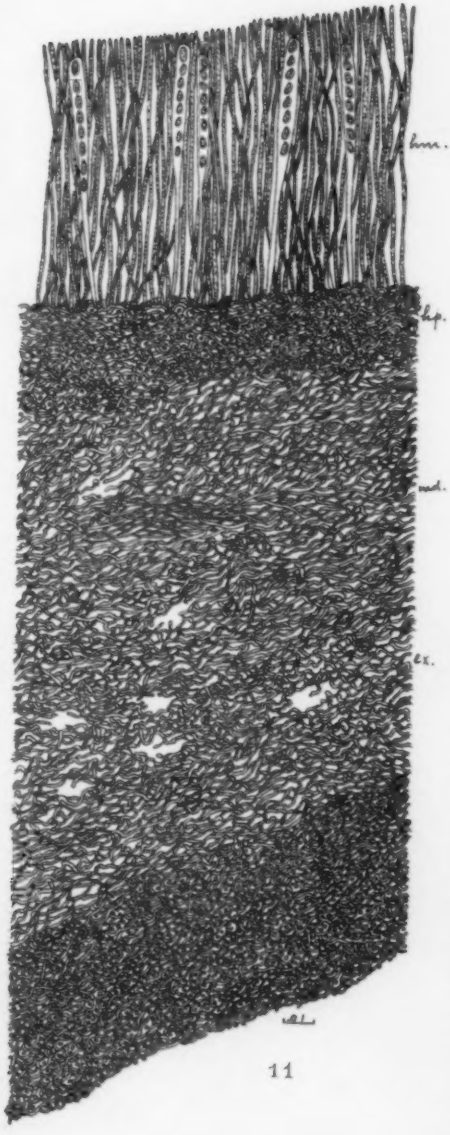




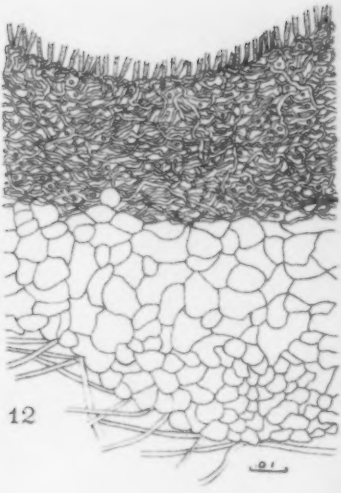


DURAND ON THE PEZIZINEAE.

THE HELIOTYPE PRINTING CO., BOSTON.

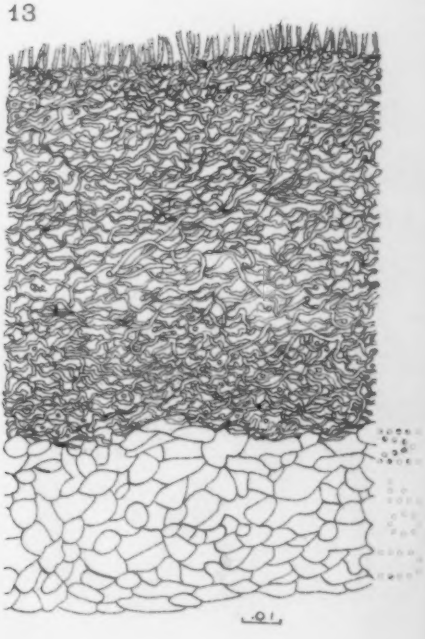


11



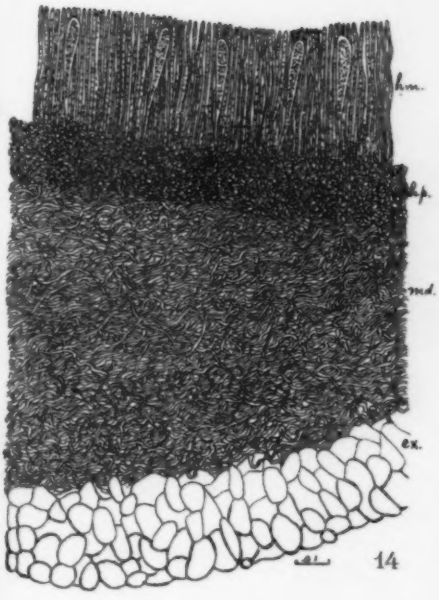
12

13

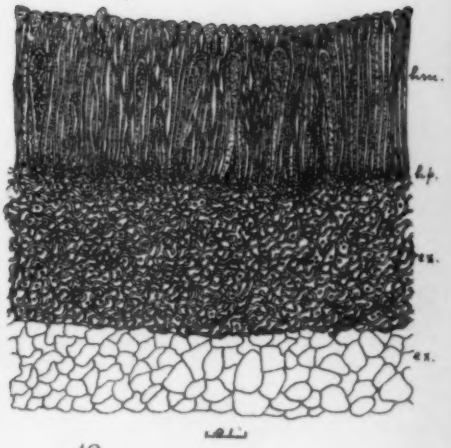


DURAND ON THE PEZIZINEAE.

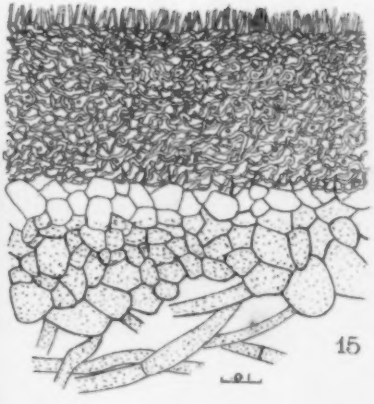
THE HELIOTYPE PRINTING CO., BOSTON.



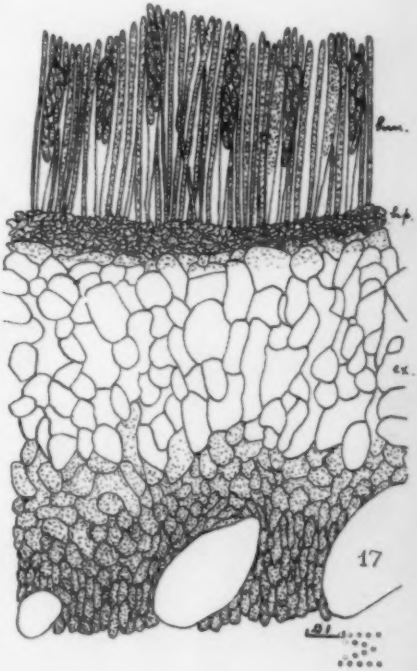
14



16



15



17

DURAND ON THE PEZIZINEAE.

THE HELIOTYPE PRINTING CO., BOSTON.

HILL ON CELTIS.

THE HELIOTYPE PRINTING CO., BOSTON.

VOL. 27 DECEMBER, 1900 No. 12

BULLETIN

OF THE

TORREY BOTANICAL CLUB

EDITOR

LUCIEN MARCUS UNDERWOOD

ASSOCIATE EDITORS

CARLTON CLARENCE CURTIS
BYRON DAVID HALSTED
ARTHUR HOLLICK
MARSHALL AVERY HOWE
FRANCIS ERNEST LLOYD
DANIEL TREMBLY MACDOUGAL
ANNA MURRAY VAIL

CONTENTS

New Species of Fungi: *Charles H. Peck*. 609
Studies on the Rocky Mountain Flora.—III: *P. A. Rydberg* 614
A List of the Pteridophyta collected in Alaska in 1900 by Mr. J. B. Flett, with description of a new *Dryopteris*: *William R. Maxon* 637
Beiträge zur Flechten-Flora Süd-Californiens: *Dr. A. Zahlbruckner* 642
Bryological Notes.—I: *Elizabeth G. Britton* 648
Proceedings of the Club. 650
INDEX TO RECENT LITERATURE RELATING TO AMERICAN BOTANY 650

PUBLISHED FOR THE CLUB

THE NEW ERA PRINTING COMPANY
LANCASTER, PA.

THE TORREY BOTANICAL CLUB

OFFICERS FOR 1900

President,

HON. ADDISON BROWN.

Vice Presidents,

T. F. ALLEN, M. D. HENRY H. RUSBY, M. D.

Recording Secretary,

PROF. EDW. S. BURGESS,
Normal College, New York City.

Corresponding Secretary,

DR. JOHN K. SMALL,
Botanical Garden, Bronx Park, New York City.

Editor,

L. M. UNDERWOOD, Ph. D.,
Columbia University.

Treasurer,

MATURIN L. DELAFIELD, JR.
56 Liberty Street, New York City.

Associate Editors,

ANNA MURRAY VAIL, BYRON D. HALSTED, Sc. D.
ARTHUR HOLLICK, Ph. D., CARLTON C. CURTIS, Ph. D.,
MARSHALL A. HOWE, Ph. D., PROF. FRANCIS E. LLOYD.
DANIEL T. MACDOUGAL, Ph. D.

Curator,

HELEN M. INGERSOLL.

Librarian,

PER AXEL RYDBERG, Ph. D.

Committee on Finance.

J. I. KANE. WM. E. DODGE.

Committee on Admissions.

CORNELIUS VAN BRUNT, JEANNETTE B. GREENE, M. D.,
319 E. 57th Street, New York City. 133 W. 41st Street, New York City.

JOHN K. SMALL, Ph. D.
Botanical Garden, Bronx Park.

Committee on Library and Herbarium.

PER AXEL RYDBERG, Ph. D., MARIE L. SANIAL,
HELEN M. INGERSOLL, ALICE M. ISAACS.

Committees on the Local Flora,

PROF. N. L. BRITTON, Ph. D.,

PHANEROGAMIA,

EUGENE P. BICKNELL,
H. H. RUSBY, M. D.,
REV. GEO. D. HULST,

CRYPTOGAMIA,

PROF. L. M. UNDERWOOD
MARSHALL A. HOWE, Ph. D.,
MRS. ELIZABETH G. BRITTON.

Committee on Excursions.

DR. L. SCHOENEY,
1670 Lexington Avenue, New York City.

GEORGE V. NASH, EUGENE SMITH,
MARIE L. SANIAL, W. A. BASTEDO.

Committee on Program.

DR. H. H. RUSBY, DR. C. C. CURTIS,
MRS. ELIZABETH G. BRITTON.

The Club meets regularly at the College of Pharmacy, 115 West 68th Street New York City, on the second Tuesday and last Wednesday of each month, except June, July, August and September, at 8 o'clock, P. M. Botanists are cordially invited to attend.

MEMBERS OF THE CLUB will please remit their annual dues for 1900, now payable to Mr. Maturin L. Delafield, Jr., Treasurer, 56 Liberty St., New York City.

PUBLICATIONS BY OFFICERS AND STUDENTS OF THE DEPARTMENT OF BOTANY, COLUMBIA UNIVERSITY

1. MEMOIRS OF THE DEPARTMENT:

Vol. 1. A Monograph of the North American Species of the Genus *Polygonum* (1895). By John Kunkel Small, Fellow in Botany, 1893–1895; Curator of the Herbarium, 1895–1898.

Quarto, 178 pages, 84 plates. Price $6.00.

Vol. 2. A Monograph of the North American Potentilleae (1898). By Per Axel Rydberg, Fellow in Botany, 1896–7.

Quarto, 224 pages, 112 plates. Price $6.00.

2. CONTRIBUTIONS FROM THE DEPARTMENT:

Vol. 1. Nos. 1–25. 1886–1892. Price $5.00.
Vol. 2. Nos. 26–50. 1892–1894. Price $5.00.
Vol. 3. Nos. 51–75. 1894–1895. Price $5.00.
Vol. 4. Nos. 76–100. 1895–1896. Price $5.00.
Vol. 5. Nos. 101–125. 1896–1897. Price $5.00.
Vol. 6. Nos. 126–150. 1897–1898. Price $5.00.
Vol. 7. Nos. 151–(current).

3. A Text-book of General Lichenology (1896). By Albert Schneider, Fellow in Botany, 1895–1896.

Octavo, 230 pages, 76 plates. Price $4.25 (cloth); $3.80 (paper). Published by Willard N. Clute & Co. Binghamton, N. Y.

The Department invites propositions relative to exchanges of herbarium material or botanical books for any of the above named publications. Address Professor L. M. Underwood, Columbia University, N. Y. City. A list of the titles of Contributions with prices of such as can be separately supplied, may be had on application. Many of the earlier numbers are out of print, but a few complete sets can be supplied.

4. An Illustrated Flora of the Northern United States, Canada, and the British Possessions from Newfoundland to the Parallel of the Southern Boundary of Virginia, and from the Atlantic Ocean westward to the 102d Meridian (1896–1898). By Nathaniel Lord Britton, Professor of Botany, 1891–1896; Emeritus Professor 1896,—and Hon. Addison Brown.

Three volumes, royal octavo. Vol. 1, 612 pages; Vol. 2 642 pages; Vol. 3, 588 pages; 4162 figures in the text, illustrating, every species described.

Published by Charles Scribner's Sons, New York. Price, in cloth, $9.00 for the three volumes; with the indexes and keys bound separately, $10.00.

5. Our Native Ferns and their Allies. (Fifth Edition) 1896. By Lucien Marcus Underwood, Professor of Botany, 1896–.

Duodecimo, 156 pages, 35 figures. Published by Henry Holt & Co. New York. Price $1.00.

6. A Text-book of General Botany (1897). By Carlton Clarence Curtis, Assistant in Botany, 1892–1895; Tutor in Botany, 1895–.

Octavo, 360 pages; 87 illustrations. Published by Longmans, Green & Co. New York. Price $3.00.

UNDERWOOD'S

Moulds, Mildews and Mushrooms.

A Guide to the Systematic Study of the Fungi and Mycetozoa and their Literature. Illustrated with ten heliotype plates, one colored. By LUCIEN M. UNDERWOOD.

12mo. Pp. 236. Price $1.50 *net.*

Contains synopses of the genera of fleshy and parasitic fungi, with historical sketch of the study of mycology in America, and copious references to the literature of the subject.

Sufficiently technical for accuracy, but intended to enable the novice to recognize the systematic position of the ordinary fungi of fields and woods. Particular attention is paid to the edible species.

HENRY HOLT & CO.,

29 West 23d Street, NEW YORK.

MEMOIRS FROM THE DEPARTMENT OF BOTANY OF COLUMBIA UNIVERSITY.

Vol. II.

A Monograph of the North American Potentilleae

By PER AXEL RYDBERG, Ph.D.

Quarto, 225 pages, 112 full-page plates. Price, $6.00 *net.*

A companion volume to Dr. John K. Small's "Monograph of the North American Species of the Genus *Polygonum*," published in 1895, which may be had at the same price. Address

L. M. UNDERWOOD, Columbia University, New York City.

Morphology and Histology of Plants

Part I., **Morphology,** by H. H. RUSBY.
Part II., **Histology,** by S. E. JELLIFFE.

A modern botanical text-book, based upon correct principles of teaching, and with the topics arranged in logical sequence.

Especially adapted to prepare those without a teacher for the determination of plants and for the study of Vegetable Physiology.

Large Octavo, 382 Pages, 693 Illustrations.

Sent postpaid on receipt of three dollars, by either of the authors, at 115 West 68th Street, N. Y. City. Table of Contents mailed upon application.

WET AND DRY

Cryptogamic and Phaenogamic

PLANT MATERIAL

collected and preserved especially

FOR CLASS STUDY.

Microscopes, Lenses, Cover Glasses and Slides, Forceps, Scalpels and Needles. "Laboratory Note Book" of high grade Drawing Paper with alternate blank and ruled pages. Glassware, Stains, Mounting Paper, etc.

Cambridge Botanical Supply Co.,

CAMBRIDGE, MASS.

Everything Useful to Botanists.

Living Plants and Their Properties

By PROF. J. C. ARTHUR, *Purdue University*, and
PROF. D. T. MACDOUGAL, *Bedford Park, New York City.*

A timely book of 12 chapters dealing with the special senses of plants, development of irritability, compass plants, sensitive plants, effects of cold, growth of leaves, significance of color, comparison of plants and animals, etc., in a non-technical manner. Original illustrations, interesting, comprehensive and thoroughly modern. Printed on enamelled paper, 30 illustrations, 242 + 8 pages, marginal sub-titles. Handsomely bound in cloth Postpaid, $1 25.

Send orders to Dr. D. T. MACDOUGAL, Bedford Park, New York City, or to MORRIS AND WILSON, University Book Store, Minneapolis, Minn.

COMMENTS.

It is a collection of delightfully written essays on certain of the more important and interesting features of li ving plants in the broadest sense. The facts set forth are in all cases the latest resul s of investigation in the various lines, and the language is simple and non-technical.—*Plant World*

The book will make an admirable addition to the scientific alcove of every pu blic library.—Prof. C. E. BESSEY.

It is an interesting volume to all who care to know what science has recently discovered in physiology and pathology of the vegetable kingdom.—*New York World.*

A Text-Book of General Lichenology

With Descriptions and Figures of the Genera Occurring in the Northeastern United States.

By ALBERT SCHNEIDER, M. S., M.D.

The only modern work on North American Lichens, including a discussion of their Morphology and Physiology, with a special reference to the phenomena of symbiosis.

Large octavo, 230 pages, 76 full-page plates. Price in paper, net, ***$3.80;*** in cloth, ***$4.25.*** Sample pages will be sent on application.

PUBLISHED BY

WILLARD N. CLUTE & COMPANY, Binghampton, N.Y.

Back numbers of the BULLETIN OF THE TORREY BOTANICAL CLUB wanted to complete files, as follows:

Vol. 7 (1880) Nos. 1, 9.
Vol. 8 (1881) Nos. 2, 10, 11.
Vol. 9 (1882) Nos. 1, 5.
Vol. 11 (1884) Nos. 1, 2, 3
Vol. 12 (1885) Nos. 1, 2, 3.
Vol. 14 (1887) Nos. 1, 2.
Vol. 15 (1888) any numbers.
Vol 16 (1889) Nos. 3, 4.
Vol. 17 (1890) Nos. (4 8, 9, 10, 12.
Vol. 18 (1891) No. 1.

Contributions of duplicate numbers requested of members of the Club. Other possessing numbers invited to state prices.

ADDRESS *TORREY BOTANICAL CLUB,*
COLUMBIA UNIVERSITY, NEW YORK CITY

PUBLICATIONS

OF

The New York Botanical Garden

Journal of the New York Botanical Garden, monthly, illustrated, containing notes, news and non-technical articles of general interest. Free to all members of the Garden. To others, 10 cents a copy; $1.00 a year. [Not offered in exchange.] Subscriptions and remittances should be sent to 41 North Queen street, Lancaster, Pa., or Bronx Park, New York City.

Bulletin of the New York Botanical Garden, containing the reports of the Director-in-Chief and other official documents, and technical articles embodying the results of investigations carried out in the Garden. Nos. 1–5, 449 pp., 3 maps, and 12 plates, 1896–1900. Free to all members of the Garden. To others, 25 cents a copy.

Memoirs of the New York Botanical Garden, Vol. 1. An Annotated Catalogue of the Flora of Montana and the Yellowstone Park, by Dr. Per Axel Rydberg, assistant curator of the museums. An arrangement and critical discussion of the Pteridophytes and Phanerogams of the region with notes from the author's field book and including descriptions of 163 new species. ix + 492 pp. Roy. 8vo, with detailed map. Price to members of the Garden, $1.00. To others, $2.00. [Not offered in exchange.]

Contributions from the New York Botanical Garden. A series of technical papers written by students or members of the staff, and reprinted from journals other than the above. Price, 25 cents each.

No. 1. Symbiosis and Saprophytism, by Dr. D. T. MacDougal.

No. 2. New Species from western United States, by Dr. Per Axel Rydberg.

No. 3. The dichotomous *Panicums*: some new Species, by Geo. V. Nash.

No. 4. *Delphinium Carolinianum* and related Species by Dr. Per Axel Rydberg.

No. 5. Studies on the Rocky Mountain Flora I, by Dr. Per Axel Rydberg.

No. 6. Notes and Descriptions of North American Plants I and II, by Dr. J. K. Small.

No. 7. Vegetative Reproduction and Multiplication in *Erythronium*, by Frederick H. Blodgett.

No. 8. Two New Species of *Grimmia* from Montana, by R. S. Williams.

No 9. Studies on the Rocky Mountain Flora II, by Dr. Per Axel Rydberg.

All subscriptions and remittances should be sent to

NEW YORK BOTANICAL GARDEN

BRONX PARK, NEW YORK CITY

ESTABLISHED 1851.

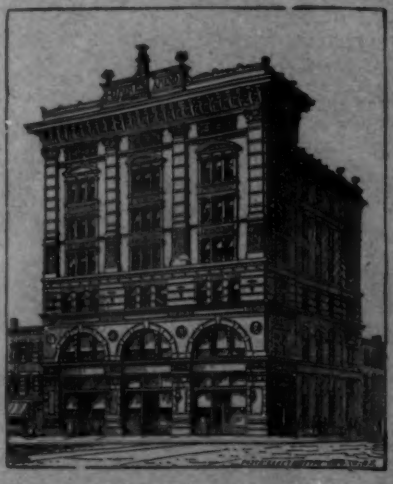
EIMER & AMEND,

MANUFACTURERS AND IMPORTERS OF

Chemicals and Chemical Apparatus,

205, 207, 209 & 211 Third Ave.,

Corner of 18th Street. NEW YORK.



SOLE AGENTS FOR THE UNITED STATES OF NORTH AMERICA, FOR

E. March's Sæline Chemical Stone Ware.

Schleicher & Schuell's Chemically Pure and Common Filter Paper.

Doctor C. Scheibler's Saccharometers (Polariscopes).

Prof. Jolly's Specific Gravity Balances, etc.

Le Brun F. Desmontes & Co., of Paris, Platinum.

H. Tronesdorff's C. P. Chemicals.

SPECIALTIES:—Bacterioscopical Apparatus, Normal Graduated Glassware, Porcelain from the Roval Berlin and Meissen Factories, Bohemian and German Glassware, Filter Papers, Agate Mortars, Pure Hammered Platina, Balances and Weights, Copperware, Bunsen's Burners and Combustion Furnaces, Apparatus and Chemicals for Sugar Chemists.

LABORATORY OUTFITS

FOR

FERTILIZERS, ASSAYERS, UNIVERSITIES AND COLLEGES

GLASS-BLOWING, ETCHING, GRINDING AND REPAIRING

PUBLICATIONS OF THE TORREY BOTANICAL CLUB.

(1) BULLETIN.

A monthly journal devoted to general botany. Vol. 26 published in 1899 contained 659 pages of text and 23 full-page plates. Price $3 00 per annum. For Europe 14 shillings. Dulau & Co., 37 Soho Square. London, are agents for England.

As the supply of several of the volumes is limited, libraries desiring to complete their files should apply at once. Yearly volumes 1–5 (1870–1874), One Dollar each. Vol. 6 (1875–1879), extending over five years, is furnished at the subscription price of Five Dollars. Vols. 7–16 (1880–1889), can only be had complete in orders for full sets.

Vols. 17–25 (1890–1898) are furnished at the published price of Two Dollars each, except Vols. 18 and 21, which can be had only in orders for full sets.

Single copies (20 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS.

The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly and an invariable price is fixed for each.

Volume 1, No. 1.—Studies of the Types of various Species of the genus *Carex*. By L. H. Bailey. Price, $1.00.

No. 2.—A List of the Marine Algæ hitherto observed on the Coasts of New Jersey and Staten Island. By Isaac C. Martindale. Price, 50 cents.

No. 3.—An Enumeration of the Hepaticæ collected by Dr. H. H. Rusby in South America, with descriptions of many new species. By Richard Spruce. Price, 75 cents.

No. 4.—On Seedless Fruits. By E. Lewis Sturtevant. Price, 75 cents.

Volume 2, No. 1.—On reserve Food Materials in Buds and surrounding Parts, with two plates. By Byron D. Halsted. (Only with full volumes.)

No. 2.—Contributions to the Botany of Virginia, with two plates. By Anna Murray Vail and Arthur Hollick. Price, 75 cents.

No. 4.—A Monograph of the North American Species of the Genus *Polygala*. By William E. Wheelock. Price, 75 cents.

Vol. 3. No. 1.—On the Flora of Western North Carolina and contiguous Territory. By John K. Small and A. A. Heller. (Only with full volumes.)

No. 2.—A Revision of the North American Naiadaceæ with illustrations of all the species. By Thomas Morong. Price, $2.00.

No. 3.—An Enumeration of the Plants collected in Bolivia by Miguel Bang. By Henry H. Rusby. Price, 50 cents.

Vol. 4. No. 1.—Index Hepaticarum. Part 1, Bibliography. By Lucien M. Underwood. Price, 75 cents.

No 2.—Report on the Botanical Exploration of Virginia during the Season of 1892. By John K. Small and Anna Murray Vail. Price, 50 cents.

No. 3.—An Enumeration of the Plants collected in Bolivia by Miguel Bang—II. By Henry H. Rusby. Price, 50 cents.

No. 4.—*Arachis hypogæa* L., with three plates. By Anna Stockton Pettit. Price, 50 cents.

No. 5.—Monograph of *Physalis* and related Genera. By P. A. Rydberg. Price, 75 cents.

Vol. 5. List of Pteridophyta and Spermatophyta growing without cultivation in Northeastern North America. Prepared by the Botanical Club, A. A. A. S. Price, $3.00.

Vol. 6. No. 1.—An Enumeration of the Plants collected in Bolivia by Miguel Bang—III. By Henry H. Rusby. Price, $1.25.

No. 2.—A Revision of the North American Isotheciaceæ and Brachythecia. By Abel Joel Grout. Price, 50 cents.

No. 3.—The Life History of *Sphærella lacustris* (*Hæmatococcus pluvialis*). With two colored plates. By Tracy Elliot Hazen. Price, 50 cents.

No. 4.—A Review of the Genera of Ferns proposed prior to 1832. By Lucien M. Underwood. Price, 35 cents.

No. 5.—Notes on the Lichen Distribution in the Upper Mississippi Valley. By Bruce Fink. Price, 25 cents.

Vol. 7. The Hepaticæ and Anthocerotes of California. With thirty five plates. By Marshall Avery Howe. Price, $3.00.

Vol 8. No. 1, Part 1.—The Comparative Embryology of the Rubiaceæ. With four plates. By Francis Ernest Lloyd. Price, 50 cents.

Vol. 9. Monograph of the Erysiphaceæ. By E. S. Salmon, F.L.S. Price, $3.00.

---

(3) The Preliminary Catalogue of Anthophyta and Pteridophyta reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Address: **L. M. UNDERWOOD,**
COLUMBIA UNIVERSITY, NEW YORK CITY.